European Commission

EU CBRNe Glossary

EU Glossary on Chemical, Biological, Radiological, Nuclear, and Explosive risks

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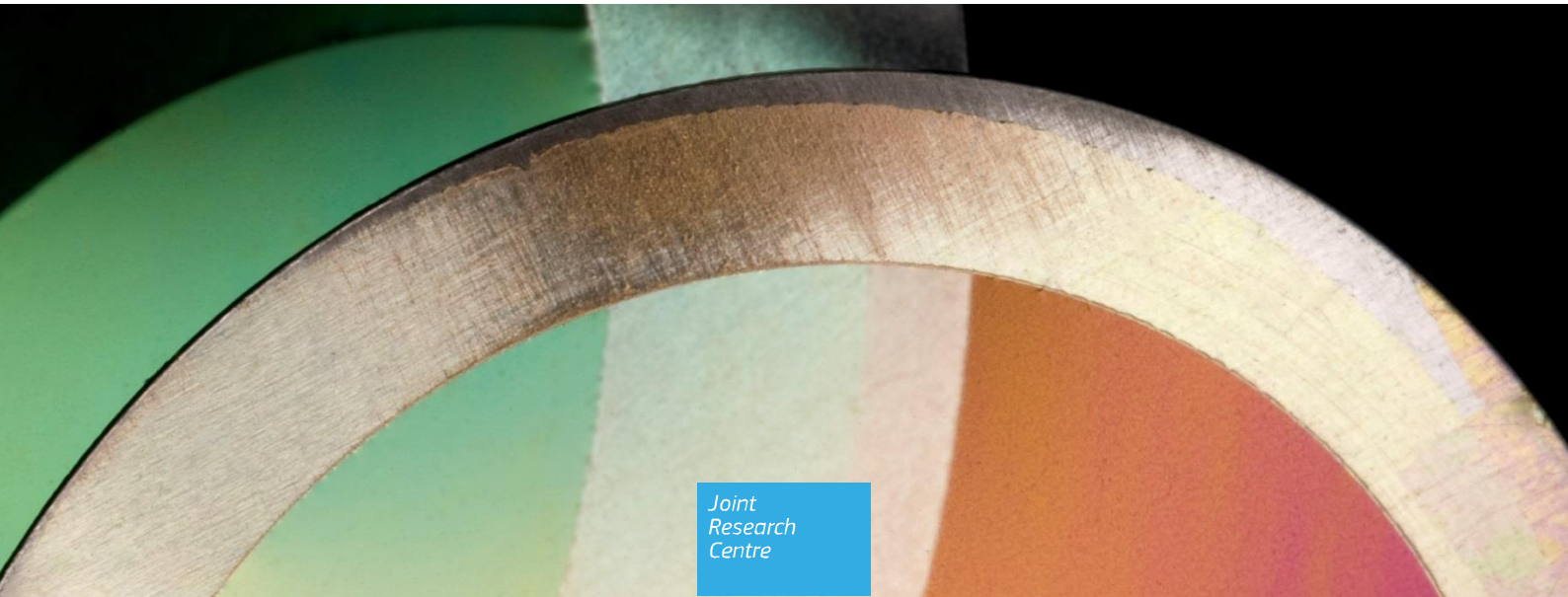

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Abstract

The EU CBRNe Glossary is the EU official glossary on chemical, biological, radiological, nuclear, and explosive risks (CBRNe). It is an information tool for practitioners in CBRNe management and response developed by the European Commission. The aim is to achieve a common understanding of terms related to CBRNe areas and facilitate the work of all intervenients in CBRNe-related activities not only within the European Union, but also outside its borders.

EU CBRNe Glossary

A1 and A2

Are categories to determine the type of packaging for transport of radioactive material. The categories are corresponding to the maximum activity, expressed in Becquerel.

- A1 refers to a non-dispersible solid radioactive material or a sealed capsule containing radioactive material,
- A2 refers to the normal form of radioactive material.

The maximum Becquerel values for A1 or A2 differ for various nuclides.

See: ADR.

ADR

The 'European Agreement concerning the International Carriage of Dangerous Goods by Road' (ADR) stipulates that the trans boundary road transport of dangerous goods must comply with:

- *Annex A* as regards the goods, in particular their packaging and labelling; and
- *Annex B* as regards the construction, equipment and operation of the vehicle carrying the goods

See: Dangerous goods core legislation.

ADR classes

See: Classes of dangerous goods.

ADR labels

The regulations for the transport of dangerous goods (ADR) specify that hazard labels are diamond-shaped (i.e. squares set at an angle of 45°), in distinctive colours, and contain a hazard symbol. A label may also contain a class number, a UN number, or a word or phrase describing the hazard (e.g. FLAMMABLE).

AEGL

An acute exposure guideline level (AEGL) is a toxicologically substantiated maximum exposure level intended for the protection of the general public against an once-in-a-lifetime, or rare, exposure to airborne chemicals.

It represents the airborne concentration of a substance at or above which it is predicted that the general population could experience:

1. notable discomfort (AEGL-1);
2. irreversible or other serious, long-lasting effects or an impaired ability to escape (AEGL-2); or
3. life-threatening health effects or death (AEGL-3). See: Exposure limits for chemicals.

See: Exposure limits for chemicals.

Abandoned chemical weapons

The Chemical Weapons Convention defines abandoned chemical weapons (ACWs) as chemical weapons, including old chemical weapons, abandoned by a State after 1 January 1925 on the territory of another State without the consent of the latter.

Absolute zero

The lowest possible temperature that can only be reached asymptotically. It is theoretical and inaccessible. At this temperature the atoms of a substance stop transmitting thermal energy – i.e. they are completely stationary. By international agreement, absolute zero is defined precisely as 0 K on the Kelvin scale, which is an absolute temperature scale, and -273.15°C on the Celsius scale.

Absorbed dose

Energy from ionising radiation absorbed per unit mass.

Note: Expressed in the unit gray (Gy). absorbed dose

[SOURCE: CEN Standard EN 17173:2020 European CBRNE glossary]

Absorbed radiation dose

A measure of the energy transferred by radiation into matter. Its unit is the gray (symbol Gy), where 1 Gy = 1 joule per kilogram of matter.

Accident

Unplanned and unintended event that interrupts an activity and sometimes causes injury or damage, including operating errors, equipment failures and other mishaps, the consequences or potential consequences of which are not negligible from the point of view of protection or safety.

[SOURCE: CEN Standard EN 17173:2020 'European CBRNE glossary']

Acetone

Chemical formula (CH3)2CO, CAS No. 67-64-1, UN No. 1090

Acetone (propanone) is a colourless, volatile (boiling point approx. 56 C under atmospheric pressure) flammable liquid used as a solvent and as a component of some types of thinner. It is precursor for some unstable IED explosive. It is produced in large quantities.

See: HPVC.

Acetyl cholinesterase

Acetylcholinesterase (AChE) is an important enzyme (molecule produced by a cell to induce a specific biochemical reaction) in the nervous system. AChE breaks down acetylcholine, most neurotransmitter substance at the 'cholinergic' synapses (nerve 'couplings' that permit a nerve cell to pass a signal to another cell). This is essential for the normal functioning of these synapses, as it enables short impulses and avoids over-stimulation at the synapses.

Acetylcholinesterase inhibitor

An acetylcholinesterase inhibitor (AChEI) or anti-cholinesterase is a chemical that inhibits acetylcholinesterase in breaking down acetylcholine, thereby increasing the amount of acetylcholine and causing over-stimulation at the cholinergic synapses. AChEIs are categorised as reversible, quasi- irreversible (or pseudo-irreversible) and irreversible inhibitors, the first two groups being the most relevant.

Active decontamination

Employment of chemical, biological or mechanical processes to remove or neutralize chemical, biological or radioactive materials.

Note 1: Active decontamination is conducted when contamination will adversely affect the operational capabilities.

Note 2: There are three levels of active decontamination employed by operational units: immediate, operational and thorough decontamination.

See: Passive decontamination.

[SOURCE: CEN Standard EN 17173:2020 'European CBRNE Glossary']

Activity of an element RN

The activity of an element is the number of disintegrations of radioactive nuclei per second. The unit is the Becquerel, symbol Bq.

Acute infection

An acute infection is characterised by a rapid onset of disease with a relatively short duration of symptoms and resolution within days (see in comparison: chronic infection). Acute viral infections are typically observed with pathogens such as influenza virus and rhinovirus, but also with very severe infections like Ebola hemorrhagic fever.

It is important to distinguish viral from bacterial infections, because most of the acute bacterial infections can be treated with antibiotics, while (some) acute viral infections are treated with antiviral drugs.

Aerogenic infection

Or airborne infection: infection with viruses, bacteria or fungi (or their spores) by inhalation of the organisms. It can be distinguished between droplets (organisms that are suspended in the air on water droplets.

>100µm) or aerosols (organisms in a gas suspended on nuclei of very fine droplets, dust particles or other carrier substances <10µm).

To prevent an infection with droplets, a distance of 2-3 meters or a barrier are appropriate measures. Protection against aerosols is only sufficient by using a respiratory filter mask (see FFP mask), because aerosols can cover long distances.

Aerosol

A suspension of very small solid, liquid or solution particles dispersed in air or another gas.

The solid particle mix is also referred to as smoke, and the liquid particle mix as fog or mist.

Agent Orange

One of the best-known defoliants. It was used during the Vietnam War (1961-1971).

Agroterrorism

The deliberate malicious introduction of chemical, biological, radiological, nuclear agents against crops and livestock with the goal of disrupt the food chain, generating fear, causing economic losses and impaired food security by disruption or damage of a country's agriculture, and/or undermining social stability.

Airbag

A passive restraint system used in motor vehicles consisting of a flexible bag that is rapidly inflated by gas (generated by the combustion of a pyrotechnic mixture) during an automobile collision.

Alpha radiation

A type of radiation emitted during radioactive decay, which is composed of two neutrons and two protons. A few centimeters of air or a thin layer of matter shields alpha radiation so that there are generally no concerns about external exposure because the particles normally do not pass through skin. However, it is very dangerous for internal exposure (ingestion or inhalation in the body), so its presence in the environment must be assessed with caution.

All-hazards

Naturally occurring event, human induced event (both intentional and unintentional) and technology caused event with potential impact on an organization, community or society and the environment on which it depends.

[SOURCE: ISO 22300: 2018 'Security and resilience — Vocabulary']

Ambient dose equivalent

An operational quantity used for assessing effective dose in area monitoring.

Ambient monitoring

Systematic and long-term assessment methods of pollutant levels by identifying hazardous substances and determining their amount in air, dust, soil and water or materials in order to assess human or animal exposure.

Ambient radiation dose

The energy from ionising radiation absorbed per unit mass. Expressed in Gray (Gy).

Ammonia

Formula: NH_3, CAS No. 7664-41-7, UN No. 1005.

A colourless gas with a strong pungent odour. Toxic and corrosive. Frequently used in the gaseous form, liquefied (under pressure) or as a solution in water. It is a high-production volume chemical (HPVC). Liquid ammonia is widely used as an industrial refrigerant (agent R717), while the solution is used as a household cleaning agent.

Ammunition

Ammunition (munition) is a complete device charged with explosives, propellants, pyrotechnics, initiating composition or chemical, biological, radiological or nuclear material, for use in military or law enforcement operations, including demolitions. Certain suitably modified munitions may be used for training, ceremonial or non-operational purposes. Some amount of ammunition is used by civilians for hunting, sport or self-defense purposes (small firearms).

Analysis time

The time that a detection instrument needs to detect a threat substance. The analysis time is an important performance indicator for a detection instrument when detection is to be performed in a time sensitive scenario.

Annual limit of intake

The ALI is a derived limit, whose use is discouraged by international Institutions. It corresponded to the quantity or radioactivity of a specific radionuclide, which, if inhaled or ingested by a worker or member of the general public, corresponds to the corresponding annual dose limit.

See also: Dose.

Anormaly detection

See: Security Scanners.

Anthrax

An acute, infectious, febrile disease of animals and humans, caused by the Bacillus anthraces, (a bacterium that under certain conditions forms highly resistant spores capable of persisting and retaining their virulence for many years) . Three main clinical pictures are observed, depending on the route of infection of humans: the most common skin anthrax (contact with infected animals or their products), gastrointestinal anthrax (consumption of meat from infected animals) and pulmonary anthrax (inhalation of spores) (the most dangerous for humans).

Antidote

Drug (with a known action mechanism) given to a patient to counteract the toxic effects of a poison by modifying its toxicokinetics or toxicodynamics, and whose administration reliably produces a significant benefit.

[SOURCE: CEN standard EN 17173:2020 'European CBRNE glossary']

Examples include atropine and oximes as antidotes for nerve agents; physostigmin as an antidote for atropine or BZ; opioid antagonists (naloxone or naltrexone) for fentanyl and other opioids; British anti-Lewisite (BAL, dimercaprol) for Lewisite; and hydroxycobalamin (vitamin B12a, Cyanokit®) for cyanides.

Antitoxin

OR: Antitoxin: An antibody produced by human body or derived from plants, animals or microorganisms in response to and capable of neutralizing a specific biologic toxin such as those that cause diphtheria, gas gangrene, tetanus or botulism. Antitoxins are used prophylactically and therapeutically.

Arboviruses

Arboviruses (arthropod-borne viruses) represent a group of viruses that replicate in both arthropods, such as mosquitoes or ticks, and vertebrates (birds, mammals). These viruses can be transmitted to vertebrates by a bite of blood-sucking arthropods.

Argus

General rapid alert system of the European Commission and internal communication network and specific coordination process covering multisectoral crises. Uses the European Commission RAS (Rapid Alert Systems).

Note: The Directorates General of the Commission exchange information, a CCC (crisis coordination committee) can be activated.

Arsine

Inorganic compound, flammable, extremely toxic. Arsine is odoreless, but its decomposition release garlic odor similar to garlic.

Synonyms: arsenic trihydride, arsane; Formula: AsH_3, CAS No. 7784-42-1, UN No 2188.

Assembly point

In CBRNE resilience, the term is used in two ways:

- an area at the outer cordon for people assembling and awaiting evacuation from the scene,
- an area for relatives and friends awaiting victims or further information on the emergency.

See: Assistance Center.

Assistance center

Any facility (whether physical or virtual) set up during response to and recovery from an emergency to provide a range of assistance to different categories of people affected by the emergency.

Atom

This is the basic component of matter containing protons, neutrons (not present in all atoms) and electrons. The massive protons and neutrons are situated in the center of the atom, the nucleus. The much less massive electrons surround the nucleus.

The number of electrons is equal to the number of protons.

Atoms are extremely small, typical sizes are around 100 picometers.

Atomic Energy

The energy produced by atoms that is released in nuclear reactions, more specifically in the fission or fusion of the nucleus.

Atomic Number

The number of protons in the nucleus of an atom, which is equal to the number of electrons surrounding it. Chemical elements are made up of atoms and all the atoms of a particular element have the same atomic number.

Atomic absorption spectrometry

Atomic absorption spectrometry (AAS) or atomic absorption spectroscopy is a spectrometric analytical method used to determine traces and major concentrations of individual chemical elements. The method is based on the absorption of radiation by free atoms in the gaseous state.

Atropine

An antidote, which is used in combination with oximes as cholinesterase reactivator, e.g. obidoxime or pralidoxime, to counteract poisoning from organophosphorous compounds. It is an antagonist to acetylcholine and counteracts the high amount of the molecule at the 'cholinergic' receptor sites, which is why atropine is called an 'anticholinergic'.

See: Nerve agents.

Australia Group

The Australia Group (AG) is an informal forum of countries, which assists in the harmonisation of export control licensing measures. AG aims to prevent industries from contributing to the development and proliferation of chemical and biological weapons (of mass destruction).

Note: Documents of the AG are not legally binding per se, nevertheless the lists of dual-use goods emitted by AG are taken over by the Council Regulation (EC) N°428/2009 (2017 consolidated version) and thus, become legally binding at EU level.

Authorised carrier, RN

Any person or entity which arranges the transport of radioactive material including special fissile material on its own behalf or on behalf of others, in their name or on its own, even if using the means of others responsible for the staff, vehicles and structures which are made available. In some countries, carriers previously approved by the competent authorities must only carry out transportation by land, sea or air of special fissionable material in any quantity of radioactive material.

Autoignition temperature

The autoignition temperature or kindling point of a substance is the lowest temperature at which it will spontaneously ignite in a normal atmosphere without an external source of ignition, such as a flame or spark. This temperature falls as the pressure or concentration of oxygen increases.

Aviation security

Aviation security means the combination of measures and human and material resources intended to safeguard civil aviation against acts of unlawful interference that jeopardize the security of civil aviation.

See: Regulation (EC) No 300/2008.

Avirulent

A bacterium, virus, fungus or parasite, which is able to infect an animal and/or human without inducing a clinical disease. Infection can be verified by determining the immune response.

Bacillus anthracis

Bacillus anthracis is the causative agent of anthrax. It is a relatively large Gram-positive, non-motile, rod-shaped bacterium occurring typically as chains of bacteria under the microscope. A broad spectrum of animals as well as humans can be infected by *Bacillus anthracis*. The bacterium exists in spore form in the soil, and can survive for decades in this state.

Background radiation

This radiation is continuously present in the environment and is emitted from a variety of natural and artificial sources.

See: Natural background radiation.

Bacterium

Bacterium is a prokaryotic, in most cases a single-cell, self-reproducing microorganism of few micrometres in size, lacking a true nucleus and organelles. It is surrounded by a cytoplasmic membrane and in most cases additionally by a cell wall. Bacteria typically live in soil, water, organic matter, or the bodies of plants and animals, that make their own food especially from sunlight or are saprophytic or parasitic. Some of them are capable to induce disease in humans, animals or plants.

Becquerel

A unit of radioactivity is called a Becquerel, symbol Bq, which corresponds to one nucleus disintegration per second. In the past, the unit curie was widely used, corresponding to 37 billion disintegrations per second.

Beta radiation

This type of radiation is emitted by a nucleus during radioactive decay. Beta particles have a charge: those that are negatively charged are electrons and those that are positively charged are called positrons. Most beta particles can be blocked by a few millimeters of plastic, aluminum or glass. Extremely dangerous if source of beta radiation is inhaled or ingested.

See: Natural background radiation.

Binary device, chemicals

The precursor which plays the most important role in determining the toxic properties of the final product and reacts rapidly with other chemicals in the binary or multicomponent system.

[Source: Chemical Weapons Convention (CWC): Article II, Definitions and Criteria]

Note 1: A binary device is also called multicomponent chemical system.

Note 2: When the delivery mean i.e. missile or ammunition projectile, rockets, grenade, etc.) is fired, the initial substances are mixed and allowed to react, producing a chemical warfare agent.

Binary explosive

A binary explosive is a two component explosive which contains two safe-to- handle compounds. The final explosive is prepared by mixing both compounds before use.

Biological Weapons Convention

The Biological and Toxin Weapons Convention (BTWC) is a multilateral disarmament treaty banning the development, production and stockpiling of biological and toxin weapons. Opened for signature in 1972, entered into force in 1975, BTWC was the first multilateral disarmament treaty banning an entire category of weapons and enjoys almost universal membership today.

The full title is Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction.

Note: In September 2019, the BWTC has 183 States Parties and 4 Signatory States.

See also: Chemical Weapons Convention, Resolution 1540.

Biological agent

Biological agents are microorganisms (bacteria, viruses, fungi or cell cultures and endoparasites including genetically modified organisms) and biological toxins which may induce an infection, disease or allergy in humans, animals or plants (adapted from EU Directive 2000/54/EC)

NOTE: For the purpose of this agreement prions are regarded as 'biological agents'; biological agents can be misused in criminal acts, bioterrorism or biological warfare.

Biological hazard

Biological hazards (or biohazards) refer to biological substances like microorganisms or biological toxins that pose a threat to the health of humans or animals or to other living organisms. National and international authorities have categorizes various agents and diseases in levels of biohazard.

See also: Biological agents.

Biological toxin

Biological toxins are toxic substances explicitly derived from living organisms or similar substances produced synthetically. These substances are non-replicative, non-infectious material butcan be extremely hazardous even in small quantities. Biological toxins can be used for contaminating of air, food, water supplies and to target specific individuals. Toxins that have been considered to be used as weapons include, among others, ricin, abrin, botulinum, staphylococcal enterotoxin B (SEB) and Tricholthecene Mycotoxins (T2s).

Biological weapon

A biological weapon is defined as a device that releases a disease-causing organisms (biological agent such as bacteria, viruses, fungi, prions or rickettsiae) or toxins of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes and that are harmful to living beings (humans or animals) and/or vegetation (plants).

A biological weapon consists therefore of the biological agent with/without the dissemination mechanism.

Note: BTWC defines a biological weapon as a microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes; and weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict. Biological weapons are devices that disseminate disease-causing organisms or poisons to kill or harm humans, animals or plants.

Biomarker

A measurable characteristic (e.g. substance or alteration), which could be used as an indicator for a CBRN exposure.

Biomonitoring

Comprises the determination with repeated measurement of the amount of harmful substances or their metabolites as biomarkers in body fluids (bound to proteins or nucleic acids) compared to reference values with the aim to estimate the body burden and potential health risk of exposed individuals.

Biorisk

The combination of the probability of occurrence of a particular harmful event and the severity of the harm when the source of harm is a biological agent or toxin. The source of the harm may be a natural, unintentional exposure, accidental release or loss, theft, misuse, diversion, unauthorised access or intentional unauthorised release.

Biosafety

Development and implementation of administrative policies, containment principles, technologies and practices (including facility design, work practices, maintenance and safety equipment) to prevent the unintentional exposure to biological agents and toxins, or their accidental release to laboratory personnel, other persons and the environment.

Biosecurity

The protection, control and accountability of high-consequence microbial agents, technologies, materials and toxins as well as critical relevant information against theft or diversion by those who intend to misuse them intentionally.

Note: According to WHO Laboratory Biosecurity Guidance, biosecurity is the protection, control and accountability for valuable biological materials [...] within laboratories, in order to prevent their unauthorized access, loss, theft, misuse, diversion or intentional release.

Bioterrorism

The threat of or an intentional release or dissemination of biological agents to cause fear, illness or death in humans, animals or plants and/or disrupt social, economic or political stability.

Bioterrorism-relevant agent

Biological agents with the potential to be used by non-state actors in a terrorist attack (bioterrorism). Several lists of bioterrorism-relevant agents have been published based on ease of transmission, severity of morbidity and mortality. In several countries, factors like interested and capabilities of non-state actors, ease of dissemination, stability of the agent in the environment, vulnerabilities of critical infrastructures and availability of countermeasures have been included to precise the list of bioterrorism- relevant agents. These lists are mostly classified and not accessible to the public.

Biotoxin

Biotoxins are toxins explicitly derived from living organisms (such as mycotoxins--produced by fungi--, zootoxins -- produced by animals--, and phytotoxins -- produced made by plants--).

Blast

A blast is caused by a rapid expansion of gases at high pressure and temperature, as a result of an explosion.

Blasting

Blasting is a process to loosening e.g. rocks and soil by the use of explosives.

See: Blasting explosives.

Blasting explosives

Blasting explosives is a term used for explosives in civil use, e.g. in quarrying, road construction, and demolition.

Blister agents or vesicants

These are chemical warfare agents that cause blistering of the skin (chemical burns) as well as severe skin, eye and mucosal pain and irritation, first as irritant and then as a cell poison. Larger doses can cause death. Effects arise from liquid or vapour contact with any exposed skin and mucous membranes (airways, eyes). Belonging to this group are:

1. the 'mustards': sulphur mustard and nitrogen mustard;
2. the 'arsenicals': Lewisite; and
3. phosgene oxime (not a 'true vesicant', but able to create solid lesions).

Dispersed in liquid or vapour (aerosol) form, according to the weather situation, these agents may persist for days. Like phosgene, mustard agents have a delayed effect.

Blood Agent

A chemical warfare agent that injures a person by interfering with cell respiration.

Note: According to OPCW: The name blood agent, like those of other groups of agents, derives from its effect on victims. Blood agents are distributed via the blood and generally enter the body via inhalation. They inhibit the ability of blood cells to utilise and transfer oxygen. Thus, blood agents are poisons that effectively cause the body to suffocate. Examples of blood agents include: hydrogen cyanide (AC), cyanogen chloride (CK) and arsine (SA).

Body scanner

See: Security Scanners.

Boiling point

The boiling point of a substance (or its mixture) is the temperature at which the vapour pressure of a liquid equals the pressure surrounding the liquid and the liquid changes into a vapour. The boiling point is depended on the pressure (under lower pressure boiling point is decreased). It is manifested by the intense evaporation of the liquid in all its volume.

Bomb

Type of ammunition, an explosive device that is placed, dropped, thrown or projected, designed to explode on impact or when detonated by a timing, proximity, or remote- control device.

Bomb suit

A protective suit that is used by Explosive Ordnance Disposal (EOD) personnel. It is a heavy suit of body armour, designed to protect against the chock from a blast as well as shrapnel from the explosive device.

Booby trap

A device (normally improvised) designed to be triggered by an unsuspecting victim. There are numerous common varieties of booby traps designed to trigger an explosive device with the intention to cause severe injury or death.

See: IED.

Booster

A part of the explosive train. Its function is to transfer and enhance the detonation wave from the initiating explosive to a level sufficient to detonate the next part of the explosive train (other booster or main charge).

Botulinum neurotoxin

Group of toxins that can be produced by the bacteria Clostridium botulinum, C. butyricum and C. baratii. Botulinum neurotoxins (BoNTs) cause a muscle- paralyzing disease (botulism) in humans or animals. Botulism is mostly foodborne (ingestion of toxins or bacteria), could be waterborne and possibly pulmonary (toxin inhalation). Clinical symptoms are muscle weakness, blurred vision, progressive paralysis, respiratory distress and cardiac dysfunction. Other forms of botulism are infant and wound botulism. Infant botulism can occur

when an infant consumes the spores of C. botulinum, which then grow and produce toxin in the intestinal tract. Wound botulism is caused by the bacterium that secretes the toxin in infected wounds. No known transmission between humans.

Brisance

Brisance is a measure of the work capacity of a high explosive e.g. accelerating matter such as metal fragments. The detonation pressure is the major factor that has influence on brisance. Brisance is an obsolete term.

Brucella species

Brucella is a genus of gram-negative bacteria and the causative agent of the zoonotic disease brucellosis. Human infections generally result from ingestion of contaminated animal products, such as undercooked meat or unpasteurised/raw dairy products, as well as direct contact to infected animals or inhalation of contaminated dust or aerosols. Human-to-human transmission is possible but rare.

Brucellosis

A zoonotic disease.

See also: Brucella species.

Bulk detection

Bulk detection refers to types of detection (see EDS) designed to find large (bulk) quantities of explosives as opposed to detectors designed to find traces of explosives.

See: Trace Detection.

Business continuity

Capability of an organization to continue the delivery of products and services within acceptable time frames at predefined capacity during a disruption.

[SOURCE: ISO 22300:2018 Security and resilience -vocabulary]

Business continuity plan

Documented information that guides an organization to respond to a disruption and resume, recover and restore the delivery of products and services consistent with its business continuity objectives.

[SOURCE: ISO 22300:2018 Security and resilience- Vocabulary]

Burkholderia mallei

Burkholderia mallei is a Gram-negative, aerobic, non-motile, rod-shaped bacterium in the family *Burkholderiaceae*. It causes Glanders, a contagious and fatal disease of horses, donkeys and mules. *B. mallei* is endemic in Asia, Africa, the Middle East and South America. The agent is transmitted by feed and contaminated water. Clinical signs are nodules and ulcerations in the upper respiratory tract and lungs, and the skin can be also affected. Human infections have occurred sporadically in laboratory workers and those in direct contact with infected domestic animals. Symptoms depend on the route of infection: localised skin infections with ulceration and swollen lymph nodes. Pulmonary infections with pneumonia, pulmonary

abscesses, pleural effusion and septicaemia are usually fatal. Chronic infections with necrotizing granulomas in different organs are reported. Because of the small number of bacteria necessary for infection and the high mortality rate in untreated cases, *B. mallei* is considered as a potential biological weapon.

B. mallei is genetically closely related to *B. pseudomallei*.

Burkholderia pseudomallei

Burkholderia pseudomallei, a Gram-negative, aerobic, motile, rod-shaped bacterium in the family *Burkholderiaceae*. It causes Melioidosis.

Burkholderia pseudomallei is endemic in Southeast Asia and Northern Australia and is also found in the South Pacific, Africa, India and the Middle East. The bacterium can be isolated from the soil and muddy water, which also represent the source of infections for humans and animals. Infections can occur by ingestion (food and water), inhalation or through wounds and abrasions. The course of the infection is influenced by the bacterial strain, the immune status of the individual and the route and dose of infection. Depending on the dose of infection, the incubation time is days to years. Chronic melioidosis is characterised by abscesses, which can occur in a variety of organs.

Pulmonary disease is the most common form with fever, coughing and pleuritic chest pain; untreated cases may progress to septicaemia that is the most severe form of the disease with a mortality rate of <90% in untreated and 30% in treated patients. *B. pseudomallei* is of concern as a potential agent for biological weapons and bioterrorism. Burkholderia pseudomallei is genetically closely related to *Burkholderia mallei.*

Burster

Bursters or bursting charges consist of a small charge of explosive used to open projectiles, or other ammunition in order to disperse their contents.

See: Commission Directive 2004/57/EC.

Calibration

Correlation of the performance of equipment (e.g. readings of an instrument) to a standard (see ISO 17025:1999).

CAS registry number

Often referred to as a CAS number, this is a unique numerical identifier (RN) assigned by the Chemical Abstracts Service (CAS) to every chemical substance described in open-access scientific literature. Some CAS numbers are assigned to groups of substances. A CAS-RN is separated by hyphens into three parts: the first comprises up to seven digits, the second comprises two digits, and the third is a single digit serving as a check digit – e.g. petroleum: CAS 9072-35-9; acetylsalicylic acid (Aspirin®): CAS 50-78-2; methyl- (iso)cyanate: CAS 624-83-9.

The CAS registry is a collection of disclosed chemical substance information, containing more than 88 million organic and inorganic substances and 65 million protein and DNA sequences.

CBRNE

CBRN is the abbreviation commonly used to describe the use of Chemical, Biological, Radiological and Nuclear materials or weapons. The malicious use of such materials could cause significant harm or disruption.

CBRN Sampling and detection module

The CBRN Sampling and Detection module (CBRNDET) is a certified module and part of the European Civil Protection capabilities. The modules are temporarily self-sufficient and are able to sustain an operation in a contaminated and/or oxygen deficient environment.

The task of CBRNDET modules are to carry out/confirm the initial assessment, including:

- the description of the dangers or the risks,
- the determination of the contaminated area,
- the assessment or confirmation of the protective measures already taken, to perform qualified sampling, to mark the contaminated area, to predict and monitor the situation, to do a dynamic assessment of the risks, including recommendations for warning and other measures, to provide support for immediate risk reduction.

CBRNDET

See: CBRN Sampling and detection module.

CBRN Resilience

The ability to reduce the risk from incidents, crisis or disaters associate to CBRN. Resilience includes the ability to withstand and recover from deliberate attacks, accidents or naturally occurring threats or incidents as well as to quickly adapt and respond to disruptions in order to ensure continuity of critical services.

CE-marking

The CE mark is a mandatory conformity marking for certain products, e.g. explosives sold within the European Economic Area (EEA). It consists of the CE logo and, if applicable, the four-digit identification number of the notified body involved in the conformity assessment procedure. The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EC directives.

CEN Workshop Agreement 15793 'Laboratory biosafety and biosecurity'

This pre-standardization publication sets out a management system approach which enables an organization to effectively identify, monitor and control the laboratory biosafety and biosecurity aspects of its activities(handling biological agents and/or toxins, regardless of type, size and biological agents handled).

Systematic identification and correction of system deficiencies leads to improved performance and control of biorisk.

Note: The document is published by CEN (European Committee for Standardization).CWA stands for CEN Workshop Agreement. It must not be confused with chemical warfare agent.

CLP Regulation

The CLP Regulation (European Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures) adopts the United Nations' Globally Harmonized System on the Classification and Labelling of Chemicals (GHS) across all European Union countries. As the GHS is a voluntary agreement rather than a law, it must be adopted through a suitable national or regional legal mechanism to ensure it becomes legally binding.

It is expected to facilitate global trade and the harmonised communication of chemical hazard information and to promote regulatory efficiency. In Europe, it complements the Registration, Evaluation, Authorisation and

Restriction of Chemicals (REACH) Regulation (EC 1907/2006) and replaces the current system within the Dangerous Substances Directive (67/548/EEC) and the Dangerous Preparations Directive (1999/45/EC).

The CLP Regulation incorporates the classification criteria and labelling rules agreed at UN level, the so-called Globally Harmonized System of Classification and Labelling of Chemicals (GHS). It introduces new classification criteria, hazard symbols (pictograms), hazard statements and precautionary statements, while taking account of elements, which are part of the current EU legislation.

CMR Substances

CMR substances are those producing carcinogenic, mutagenic and/or reprotoxic effects.

See: Health effects of chemicals, CLP Regulation.

Calcium ammonium nitrate

Calcium ammonium nitrate (CAN), Chemical formula $Ca(NO3)2 \cdot NH4 \cdot NO3$, CAS No 6484-2-2, is used as a fertilizer.

Calcium nitrate

Chemical formula $Ca(NO3)2$, CAS number 10124-37-5.

Calcium nitrate is mainly used as a fertilizer or as a concrete additive.

Canine detection

Canine detection refers to detection of e.g. explosives or drugs by the use of dogs. In the case of explosives detection.

See: EDD.

Cap sensitivity

A cap sensitive explosive is one that can be directly initiated by a standard no 8 detonator.

Capability

A demonstrable ability to respond to and recover from a particular threat or hazard.

Capability gap

The gap between the current ability to provide a response and the actual response assessed to be required for a given threat or hazard.

Capability programme

A programme to develop a range of capabilities that underpin national resilience to disruptive challenges.

Capability status

Assessment of the level of capability in place.

Capability target

The level of capability required by the planning assumptions.

Cardiotoxin

Group of toxins that cause cardiac effects. The most prominent members ofcardiotoxins are homologous proteins found in the cobra snake venom.

Carfentanil

Carfentanil or carfentanyl (Wildnil) is an analogue of the popular synthetic opioid analgesic fentanyl, and is one of the most potent opioids known (also the most potent opioid used commercially). It is marketed under the trade name Wildnil as a general anaesthetic agent for large animals.

See also: Fentanyl derivatives and incapacitating agents.

Carrier gas

Purge gas introduced so as to transport a sample through the separation unit of a gas chromatograph for analytical purposes

Note: Typical carrier gasses are helium, hydrogen, nitrogen, and argon.

[SOURCE: EN ISO 14532: 2017, 2.4.4 modified]

Carrier, RN

Any person, organisation or state administration that carries out the transport of radioactive material is referred to as a carrier. The term includes those entities that operate the transport for hire, assign it under a hire contract, occasionally hire it out for a fee (in some countries: referred to as a public carrier or contract), or which operate the transport privately (in some countries referred to as a private transporter).

Carrier, asymptomatic

An asymptomatic carrier has contracted an infectious agent without showing any apparent signs of the disease. Such carriers are capable of transmitting the agent to others. Carriers can be persons, animals or other organisms.

Cartridges

A device containing primer, case, propellant and projectile used in firearms and in some types of artillery.

A case or shell surrounding a part of projectile, a propellant and a primer.

Case fatality rate

The case fatality rate (CFR) is a measure of the severity of a disease expressed as the ratio of the number of deaths versus the number of individuals a population suffering from the same disease or injury (typically expressed in %). In other words, this is the proportion of cases of people having the disease which are fatal within a specified time.

Note 1: According to WHO (GIobal health Observatory (GHO) data, the case fatality rate (CFR) is a measure of the severity of a disease and is defined as the proportion of reported cases of a specified disease or condition which are fatal within a specified time.

Note 2: It must not be confused with mortality rate which describes the proportion of deaths in a given population at risk (in which only a part is suffering from the disease).

Casualties

Persons physically or mentally injured or killed by a CBRNE accident or incident.

See also: Victim, fatalities.

Casualty decontamination

Removal or neutralisation of hazardous levels of nuclear, radiological biological, or chemical contamination from affected / injured persons.

Cell culture

Growth of cells under controlled conditions, generally outside of their natural environment.

Certification

Certification is a systematic, documented process to verify the performance of equipment, persons, personnel or laboratories in line with an agreed set of criteria defined by the certification scheme. Usually the certification scheme is defined by a national, international standard. Certification is also known as third party conformity assessment (as per ISO classification).

Chemical Warfare Agents

Chemical warfare agents (CWA) are a group of toxic substances developed for military use. The so-called 'toxic agents' (also called 'casualty a.' or 'lethal a.') are intended to cause death or serious injury through their toxicological effects in exposed humans or animals, and include:

1. pulmonary agents (lung-damaging agents, also called choking agents –offical name according to OPCW--);
2. 'blood' agents (cyanides);
3. blistering agents (vesicants); and
4. nerve agents.

In addition to the above, there is a group of 'incapacitating agents' or 'non-lethal agents' which are intended to cause incapacitation (a temporary inability to perform one's duties).

The most important examples are BZ (causing hallucinations) and fentanyl derivatives (causing unconsciousness).

Riot-control agents, like 'tear gases', 'pepper spray' or vomiting agents, are not recognised as incapacitating agents or CWA if they are used by law enforcement.

Most chemical warfare agents are liquids (except for riot-control agents and BZ, which are solids at temperatures and pressures normally encountered).

Chemical Weapons Convention

The Chemical Weapons Convention (CWC) is anmultilateral treaty that bans the production, stockpiling, and use of chemical weapons and their precursors. The full title is Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction.

Signed in 1993, it entered into force in 1997 and regulates:

- State party obligations (art. I: never to develop, produce, otherwise acquire, stockpile, or retain chemical weapons and to destroy all chemical weapons stockpiles as well as all production facilities);
- the destruction of chemical weapons (art. IV); and
- the shutdown, and conversion or destruction of production facilities (art. V).

For preventing the spread of precursors and toxic chemicals that may be used as weapons, their development, production, acquisition, retaining, transfer and use are subject to limits (art.VI) and inspections.

Implementation of the Convention is monitored by the OPCW – Organisation for the Prohibition of Chemical Weapons. In September 2019, 193 States committed to the Chemical Weapons Convention :

- 98% of the global population live under the protection of the Convention
- 97% of the chemical weapons stockpiles declared by possessor States have been verifiably destroyed.

Chemical effects

See: Health effects of chemicals.

Chemical weapon

A chemical weapon is a chemical used to cause intentional death or harm through its toxic properties. Munitions, devices and other equipment specifically designed to weaponise toxic chemicals also fall under the definition of chemical weapons". It consists of a substance or agent (CWA) and of some form of carrier or container (e.g. ammunition).

Note 1: According to OPCW: a common conception of a chemical weapon (CW) is of a toxic chemical contained in a delivery system such as a bomb or artillery shell. While technically correct, a definition based on this conception would only cover a small portion of the range of things the Chemical Weapons Convention (CWC) prohibits as 'chemical weapons'.

Note 2: Under the Chemical Weapons Convention (CWC), the definition of a chemical weapon includes all toxic chemicals and their precursors, except when used for purposes permitted by the Convention – in quantities consistent with such a purpose.

Chemical weapons mobile destruction facility

The destruction of chemical weapons is a process whereby chemicals are converted in an essentially irreversible way into a form unsuitable for the production of chemical weapons. This irreversible process renders munitions and other devices unusable.

A mobile destruction facility consists of container-size units that can load equipment on a trailer bed. It can be assembled and disassembled repeatedly and can travel around the country to conduct CWA destruction operations.

The facility is set up in an appropriate location close to the temporary storehouse, with due attention to safety and the environment.

Chemical weapons precursor

Any chemical reactant which takes part at any stage in the production by whatever method of a toxic chemical.

Source: 'Chemical Weapons Convention'.

Chicago Convention

The Chicago Convention on International Civil Aviation establishing the International Civil Aviation Organization (ICAO) sets rules of airspace, aircraft registration and safety. An annex to the convention, Annex 17 – Security: Safeguarding International Civil Aviation Against Acts of Unlawful Interference lays out many of the fundamental rules for security in civil aviation.

Chlorine

Chemical formula: Cl_2. CAS No. 7782-50-5, UN No 1017.

Chlorine is a toxic and corrosive gas characterised by its stinging odour. It forms greenish - yellow clouds in high concentrations, and is one of the most important substances in the chemical industry (HPVC).

Chlorine was the first chemical warfare agent to be used in World War I.

LCt50: 6000 mg.min/m3

See also: Pulmonary agent.

Choking Agents

See: Pulmonary agents.

Chromatography

Chromatography is a method for separating the components of mixtures and their analysis. The basic principle is the distribution of components of a mixture between the mobile and stationary phase. One of basic analytical chemistry technique for separating compounds mixtures for further identification (frequently in detector in the same apparatus/device). Examples type of the chromatography: GC (gas chromatography), TLC (thin layer chromatography), HPLC (high performance liquid chromatography).

Chronic infection

A chronic infection is a slowly developing infection, and its duration is in the order of weeks or months. The agent is detectable in the chronic phase and might be eliminated by the immune system or an adequate treatment (for example hepatitis B, herpes). An acute infection can become a chronic infection.

Civil

Or civilian, refers to all agenciesnon-military and /or non –law enforcement.

Civil resilience

Resilience concerning civilian population and property, which is built up through national authority/governmental efforts.

Civilian explosives

Are explosives that are commercially produced for non-military use.

Examples are dynamites, ANFO, and emulsion explosives.

See also: Blasting explosives.

Classes of dangerous goods

Depending on their hazardous properties, dangerous goods are broken down into nine classes, e.g. explosives, toxic and infectious substances or radioactive material.

Classes, restricting

Dangerous goods belonging to a restrictive class can only be transported if they are specifically mentioned in the European agreement concerning the international transport of Dangerous Goods by Road (ADR)Regulation. If dangerous goods are not classified as restrictive and are not mentioned in the transport regulation they can be transported without any restrictions.

Cold zone

The uncontaminated area beyond the hot and warm zones where access is restricted for emergency response operations.

See also: Hot zone, warm zone, decontamination.

Combustible

The terms combustible and flammable both describe the ability of a material to burn. Commonly, combustible materials are less easily ignited than flammable materials as their flashpoint is above 37,8 C.

See: Flammability.

Command

The exercise of authority that is associated with a role or rank within an organisation, to give direction in order to achieve defined objectives.

Command and control

The exercise of authority through means of communications and the management of available assets and capabilities, in order to achieve defined objectives.

Command protocols

Established procedure(s) defining lines of command and responsibility in the response to an incident or emergency.

Commander

A person who exercises authority within their organization, to give direction in order to achieve defined objectives.

See also: Incident commander.

Committed effective dose

A measure of radiation risks resulting from the intake of radionuclides in the human body. Its assessment may be very complex, requiring specialised equipment to measure a person directly (with a whole body counter) or an assessment of the radioactivity content in excreta (an indirect method using radiotoxicology).

Note: Committed effective dose calculations are made over a lifetime – i.e. 70 years for infants, 50 years for adults.

Common operating picture

Single display of information collected from and shared by more than one agency or organisation that contributes to a common understanding of a situation and its associated hazards and risks along with the position of resources and other overlays of information that support individual and collective decision making.

Communicable disease

See: Contagious disease.

Community resilience

Communities' and individuals' contribution to building up civil protection which complements governmental and authorities' efforts.

Compliance assurance

For radioactive material, this refers to a systematic programme of measures applied by a competent authority, which is aimed at ensuring that the requirements of the European agreement concerning the international transport of Dangerous Goods by Road (ADR) regulation are met.

Concentration limits

See: Exposure limits for chemicals.

Concept of operations

Abbreviation: CONOPS. A high-level description of how a defined system will operate to achieve defined strategic objectives.

Confinement system

Confinement in general is the prevention or control of releases of radioactive material to the environment in operation or in accidents.

The confinement system is a set of components and fissile materials specified by the designer and approved by the competent authority to maintain safety on critical issues during the transportation of radioactive material.

See also: Containment.

Confinement system for fissile

This system comprises fissile material and packaging components, specified by the designer and approved by the competent authority, which are adequate to maintain critical safety.

Conformity assessment

Defines a set of processes that show a product, service or system meets the requirements of a consensus based standard. ISO/IEC International Standards (ISO/IEC 17000 series) provides requirements and guidance for good practice and recognition of such assessments.

ISO/IEC 17000 defines conformity assessment as demonstration that specified requirements relating to a product, process, system, person, or body are fulfilled. The methods for demonstrating conformity include testing, validation, calibration, inspection, suppliers' declarations of conformity and certification.

A manufacturer can only place a product on the EU market when it meets all the applicable requirements. The conformity assessment procedure is carried out before the product can be sold.

Confusion matrix

The confusion matrix or table of confusion contains information about actual and predicted classifications. In the field of security and detection of threat items the predicted classifications are "alarm" and "no alarm" and the actual classifications are "presence" and "no presence" of a threat item.

Consequence management

Measures taken to protect public health and safety, restore essential services, and provide emergency assistance to governments, businesses, and individuals affected by the impacts of an emergency resulting from CBRN disasters and catastrophes, including natural, man-made, or terrorist incidents.

Consequence(s)

Impact from a particular hazard or threat, measured in terms of the numbers of lives lost, people injured, the scale of damage to property, environment and the disruption to essential services and commodities.

Contagious disease

Communicable, or contagious diseases, are caused by microorganisms such as bacteria, viruses, parasites and fungi that can be spread, directly or indirectly, from one person to another. Some are transmitted through bites from insects while others are caused by ingesting contaminated food or water.

[A variety of disease-producing bacteria and viruses are carried in the mouth, nose, throat and respiratory tract. Conditions such as leprosy, tuberculosis (TB) and different strains of influenza (flu) can be spread by coughing, sneezing, and saliva or mucus on unwashed hands.

Sexually transmitted infections (STIs) such as HIV and viral hepatitis are spread through the exposure to infective bodily fluids such as blood, vaginal secretions and semen. Hepatitis is a significant concern in the African Region and the majority of people living with hepatitis B and C are unaware of their infections.

Insects play a significant role in the transmission of disease. Bites from Anopheles mosquitoes transmits malaria parasites that can wreak havoc on high-risk populations such as children under age 5 and pregnant women. Yellow fever has also seen resurgence due to reduced vaccination efforts. Many neglected tropical diseases are caused by unsafe water, poor housing conditions and poor sanitation in the Region.]

Source: WHO website.

See: Transmissible infection.

Containment system

This set of packaging components, specified by the designer, ensures the containment of radioactive material during transport.

Contamination

Presence or transfer of hazardous chemical, biological or radioactive substances/materials to personnel, structures, areas, mobile and immobile objects, surface, soil or water.

Note: In the case of a person, it is usually referred to as 'external' (skin contamination) or 'internal' contamination (due to an intake by breathing and/or ingestion).

Contingency plan

Plan prepared by a particular agency specifying the response to a potential incident within the agency's area of responsibility.

Control

The application of authority, combined with the capability to manage resources, in order to achieve defined objectives.

Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency

Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency (1986) IAEA – Sets co-operation among States Parties and IAEA in case of nuclear accidents or radiological emergencies. National points of contacts for requests' exchange, experts, equipment, and methodologies are indicated by States.

System: IAEA - International Response System.

Convention on Early Notification of a Nuclear Accident

Convention on Early Notification of a Nuclear Accident (1986) IAEA – For nuclear or radioactive accidents involving facilities or activities. States must notify and report information about the event. IAEA acts as a hub. Points of contact are established.

Convention on Nuclear Safety

Convention on Nuclear Safety (1994) IAEA- States operating land-based nuclear power plants must maintain a high level of safety by setting legal benchmarks and regulatory bodies for their implementation. Emergency preparedness plans have to be set up.

Convention on mutual assistance and cooperation between customs administrations

The purpose of the Convention – also called Naples II Convention - is the prevention, detection, prosecution and punishment of infringements of national and Community customs provisions through enhanced cooperation and mutual assistance between national customs services.

The cross border cooperation includes, amongst others, prevention, investigation and prosecution in cases of illicit traffic of nuclear material or materials or equipment intended for the manufacture of atomic, biological and/or chemical weapons.

Convention on the Physical Protection of Nuclear Material

Convention on the Physical Protection of Nuclear Material - IAEA - 1980 - Regulates international transport, domestic use storage and transport of nuclear material for peaceful purposes. Sets three categories of material, with different protection measures. Provides for recovery and response in case of unauthorized removal.

Convention on the Transboundary Effects of Industrial Accidents (UNECE) 1992

Convention on the Transboundary Effects of Industrial Accidents (UNECE) 1992– In case of industrial accident (not radiological or nuclear), regulates States' response, assistance, exchange of information. A notification system (IAN - UN/ECE Industrial Accident Notification System) is in place.

Cost benefit analysis

Financial technique that measures the cost of implementing a particular solution and compares it with the benefit delivered by that solution.

Counter terrorism

All measures measures designed to combat or prevent terrorism.

Countermeasures

Precautionary actions to protect the public, buildings, critical infrastructures and private interests.

Coxiella burnetii

Coxiella burnetii is a Gram-negative bacterium with strict intracellular life cycle and needs cellular metabolites of host cells for replication. In contrast to the large variant, which is found mainly in vivo the small variant of Coxiella, burnetii is highly resistant against environmental changes, high temperature, osmotic pressure, and ultraviolet light and survives standard disinfectants. *Coxiella burnetii* is the causal agent of the zoonosis, Q fever. *C. burnetii* is currently ranked as a "category B" bioterrorism agent by the CDC.

See also: Q-fever.

Crater

Crater is damage in the place and close proximity of explosion. Sometimes in the shape similar to upside down cone.

The crater after an explosion can be used by forensically trained personnel to estimate the size of the explosive charge.

Crisis

Unprecedented or extraordinary event or situation that threatens an organization and requires a strategic, adaptive, and timely response in order to preserve its viability and integrity.

Note 1: The event might include a high degree of uncertainty.

Note 2: The event might exceed the response capacity or capability of the organization.

Note 3: There is no adequate or appropriate plan to deal with the event such that a flexible and dynamic approach is needed.

[SOURCE: CEN/TS 17091:2018 'Crisis management - Guidance for developing a strategic capability']

Crisis management

Activities to prevent (preparedness), respond to, mitigate the effects of and recover from a crisis.

Critical diameter

Is the minimum diameter of an explosive that allows stable propagated detonation. The critical diameter can be affected by factors such as confinement.

Critical function

A service or operation the continuity of which needs to be ensured, in order to meet business objectives and/or deliver essential services.

Critical infrastructure

Those physical and information technology facilities, networks, services and assets which, if disrupted or destroyed, would have a serious impact on the health, safety, security or economic well-being of citizens or the effective functioning of governments in the Member States.

Critical mass

In nuclear physics, the term critical mass of fissile material indicates the quantity of material required to ensure a self-sustaining nuclear chain reaction. Below this amount, no nuclear reaction can continue spontaneously over time; above this quantity, a nuclear explosion may take place, under specific conditions.

Critical safety index

Or CSI is assigned to a package, over pack or container containing radioactive or fissile material.

CSI is a number used to control the accumulation of packages, over packs or containers containing fissile material. The value may be zero provided that an unlimited number of packages are subcritical.

Critical temperature

This is the temperature above which the substance cannot exist in the liquid state at any pressure.

Cross contamination

Also referred to secondary contamination. The process by which materials are unintentionally transferred from one object to another.

Curie

A curie (Ci) is an obsolete unit of (radio)activity corresponding to the activity of 1 g of radium. It corresponds to 37 thousand million disintegrations per second (i.e. Becquerel, the current unit of activity).

D-value, biological

The D-value (or decimal reduction time or dose) the time (or dose) required to reduce the level (infectious titer) of a given infectious agent by 90% by a specific inactivation procedure, for example a given dose of irradiation or a specific heat or chemical treatment.

D-value, nuclear

The D-value is that quantity of radioactive material, which, if uncontrolled, could result in the death of an exposed individual or a permanent injury that decreases that person's quality of life.

Damage reduction

Damage reduction refers to actions taken to minimize the consequences when the use of a threat substance cannot be prevented. Examples are the use of bomb suits for risky EOD operations, physical protection or increased distance to the explosive threat.

Dangerous goods

Dangerous goods are goods containing substances and articles, which have been identified as hazardous for transport and present a risk to people, property and the environment.

The transport requires an appropriate package.

See: Classes of dangerous goods, dangerous goods core legislation.

Dangerous goods core legislation

The core legislation for the transport of dangerous goods comprises:

- ADR 2013 – (1957) - UNECE United Nations Economic Commission for Europe - European Agreement Concerning the International Carriage of Dangerous Goods by road.

  Reference: http://www.unece.org/trans/danger/publi/adr/legalinst_53_tdg_adr.html

- ADN 2009 – (2000) - UNECE European Agreement concerning the International Carriage of Dangerous Goods by inland Waterways - provisions on substances' carriage in packages or bulk.

Decay

The spontaneous transformation of one nuclide into a different nuclide is referred to as radioactive decay. It is usually accompanied by the emission of alpha particles, beta particles, neutrons and/or gamma rays from the nucleus. The 'speed' of a decay process is characterised by its half-life (i.e. the time taken for half of the atoms of a radionuclide or radioisotope to undergo decay and disintegrate into another nuclide).

See also: Halflife.

Decay chain

Some radionuclides do not decay directly into a final stable nuclide, but into other intermediate radionuclides, which will also decay, thereby creating a chain of radionuclides leading from the first to the last. Each nuclide in the sequence or decay chain decays into the next until it forms a stable, end product.

Decommissioning

This covers the administrative, legal and technical process of taking a nuclear or radiological facility out of service by removing its residual radioactivity to a level that permits the radiological release of the property for unrestricted use by the general public.

Decontamination

The removal or reduction of hazardous materials from the undesirable place (contamination) to lower the risk of further harm and/or cross contamination.

See: Dry decontamination, wet decontamination.

D**eflagration**

Deflagration is a fast reaction of an explosive with rate below the speed of sound in the material. It is propagated by the produced heat (transferred also by the IR radiation) and atmospheric oxygen is not needed for propagation of the deflagration. Basic type of reaction for propellants in SALW (Small Arms and Light Weapons) ammunition.

See: SALW.

Defoliants

Defoliants are chemicals used to cause plants to drop their leaves prematurely. They can be used on crop plants such as cotton to facilitate harvesting, but are also used in warfare to eliminate enemy food crops and potential areas of concealment for enemy forces.

See also: Agent Orange.

Density

Density (symbol: ρ – (Greek: rho)) is the ratio of mass per volume – thus, the correct term in full is volumetric mass density. The average density of an object equals its total mass divided by its total volume. An object made from a comparatively dense material (such as iron) will have less volume than an object of equal mass made from a less-dense substance (such as water). The SI unit of density is the kilogram per cubic metre (kg/m3).

Depleted uranium

Depleted is uranium containing less of the isotope uranium 235 than in the natural uranium (0.72%). Depleted uranium delivers very low radiation doses per unit of mass. It has a high chemical toxicity.

See also: Uranium 238.

Design

For the transportation of radioactive material, the design means the description of a special form radioactive material, a low dispersible radioactive material, package or packaging, which enables such an item to be fully identified. This description may include specifications, engineering drawings, reports demonstrating compliance with regulatory requirements, or other relevant documentation.

Detection

In the chemical, biological, radiological, nuclear, and explosive (CBRNE) context, detection is the act of locating CBRNE hazards or discovering or perceiving the presence and in some cases, to get an assessment on the typeof CBRNE threat substances.

Detection instruments

See: Detection tubes, Security scanners, Explosive trace detector, FTIR, GC-MS, Geiger-Müller tube, HPLC, ICP-MS, Ionisation chamber, Raman spectroscopy, Sensitivity of detection equipment, X-ray machine.

Detection limit

Or Limit of Detection (LOD) refers to the smallest amount that a detection instrument is capable of reliably detecting and differentiate from any background or signal from interferents.

According to ICH guidelines, LOD refers to the lowest concentration of an analyte in a sample that can be detected, but not necessarily quantified, under the stated conditions of the test.

Thus, it is necessary to introduce also the Quantitation Limit: the Limit of Quantitation (LOQ) is the lowest concentration of an analyte in a sample that can be determined with acceptable precision and accuracy under the stated conditions of test.

Detection methods

See: Atomic Absorption Spectrometry, Chromatography, EDS, Gas chromatography, Infrared spectroscopy, Laboratory methods, Liquid chromatography, Mass spectrometry, Remote detection, X-ray fluorescence.

Detection rate

The Detection Rate of a detection instrument is a measure of its capability to make true positive alarms. A high detection rate is a desirable property of a detection instrument but there is normally also a trade-off between using an instrument sensitive enough to detect true threats (true positives) and the selectivity to reduce the risk of false alarms contributing to the False Alarm Rate.

Detection tubes

These are typically sealed glass tubes filled with a sorbent which is impregnated with chemical agents. After a specified volume of air flows through the tube, a colour reaction occurs between a substance present in the air and chemicals in the tube. The concentration of a substance is usually indicated by the intensity of the colour in the tube and length of the coloured area.

Detonating cord

Detonating cord (also called detcord or primer cord) is a strong, flexible plastic tube containing a core of explosive encased in a textile outer jacket and a plastic coating.

Detonation

Detonation is type of explosion propagated in the speed greater that sound speed. The energy is propagated by a shock wave followed by a rapid exothermic chemical reaction occurring just behind the shock wave. The detonation process does not need oxygen from the atmosphere.

Detonation velocity

Is the rate at which a detonation propagates through an explosive. It depends on the type and density of the explosive. The detonation velocity is greaterthan the speed of sound in the unreacted explosive and is typically in thousands meters per second.

Detonator

A detonator is a small cylindrical case containing an explosive to boost explosion from igniter to the main charge (secondary explosive). It is a part of the explosive train producing the detonation wave.

Diagnosis

Is the process of determining by examination the nature and circumstances of a disease condition. A diagnosis enables medical decisions about treatment and prognosis of a disease or a condition. Diagnostic tests can be performed to aid in the diagnosis or detection of disease.

Diagnostics

Comprise different methods, such as evaluation of the patient history and physical examination of the patient including the use of specific techniques or laboratory analysis, which can be used for diagnosis of the disease or injury.

Diphtheria toxin

Toxin produced by the bacteria Corynebacterium diphtheriae, which cause the acute infectious disease diphtheria. Diphtheria affects mostly the membranes of the throat and other respiratory passages and is characterised by a membranous coating of the pharynx, the nose and other tissues. The diphtheria toxin damages the tissues of the heart and central nervous system.

Dirty bomb

A type of radiological dispersal device (RDD), which consists of improvised explosive device (IED), combined with radioactive material (aka Radioactive improvised explosive device [RIED]). Dirty bombs are designed to use explosive force to disperse the radioactive material in order to cause radioactive contamination and to expose as many people as possible to the radiation.

Disarmament

Disarmament is defined by the United Nations General Assembly and refers to the reduction, limitation, physical elimination and abolition of weapons, often referring to nuclear, biological or chemical weapons of mass destruction.

According to See UNIDIR, "Coming to Terms with Security," UNIDIR/2001/16 (Geneva: UNIDIR, 2001): Disarmament aims at the physical elimination of agreed types of weapons, or mutual commitments not to produce them.

Disaster

Emergency (usually but not exclusively of natural causes) causing, or threatening to cause, widespread and serious disruption to community life through death, injury, and/or damage to property and/or the environment.

Disease

An unhealthy condition of the body (or a part of it) or the mind (illness, sickness) presented by symptoms peculiar to it. Chronic diseases are diseases of long duration (3 months or more) and generally slow progression.

Nosocomial disease is a disease acquired in a hospital, especially in reference to an infection.

Disinfection

Chemical or physical methods to render biological agents non-infectious or non-toxic. Examples for disinfection methods are heat treatment, ultraviolet light, ozone treatment or the use of chemicals.

Process to reduce the number of microorganisms, but not usually of bacterial spores, without necessarily killing or removing all organisms. (ISO 15190:2003). Disinfection is less lethal than sterilization; it does not ensure the margin of safety associated with sterilization processes.

Dispersion

Spread of radioactive particles, chemical substances or biological agents.

Disused source

A sealed source which is no longer used or intended to be used for the practice for which authorisation was granted but which continues to require safe management.

Dose (for chemicals that are not radioactive)

The amount of a substance to which a person is exposed over some time period.

Note 1: Dose is often expressed as milligram (amount) per kilogram (a measure of body weight) per day (a measure of time) when people eat or drink contaminated water, food, or soil. In general, the greater the dose, the greater the likelihood of an effect.

Note 2: Dose is a measurement of exposure.

Note 3: An "exposure dose" is how much of a substance is encountered in the environment.

Note 4: An "absorbed dose" is the amount of a substance that actually got into the body through the eyes, skin, stomach, intestines, or lungs.

Dose (for radioactive chemicals)

The amount of energy from radiation that is actually absorbed by the body.

Note: this is not the same as measurements of the amount of radiation in the environment.

[Source: Agency for Toxic Substances and Disease Registry (ATSDR)]

Dose rate, RN

The rate at which some of the quantities (absorbed dose, equivalent dose, effective dose, personal dose equivalent or ambient dose equivalent) is delivered. For example the ambient dose equivalent rate in millisievert per hour (mSv/h).

Dose, biological

The infectious dose gives information on the amount of a particular infectious agent (measured in number of microorganisms) that is necessary to lead to an infection of a host (human or animal).

See also: Infectious dose 50% (ID50), Lethal dose and Lethal dose 50% (LD50).

Dry decontamination

The use of techniques without water or liquids to decontaminate people or property.

Dual-use

Describes research, knowledge, technology (including software) and material that is intended for peaceful purposes but could potentially be misused to harm humans, animals or the environment.

The EU controls the export, transit and brokering of dual-use items so the EU can contribute to international peace and security and prevent the proliferation of Weapons of Mass Destruction (WMD).

- UN Security Council Resolution 1540
- The Nuclear Non-Proliferation Treaty
- the Chemical Weapons Convention
- the Biological Weapons Convention

EU export controls reflect commitments agreed upon in key multilateral export control regimes such as the Australia Group, the Wassenaar Arrangement, the Nuclear Suppliers Group and the Missile Technology Control Regime.

See: Dual-use item.

Dual-use item

Dual-use items are goods, software and technology normally used for civilian purposes but which may have military applications, or may contribute to the proliferation of weapons of mass destruction (WMDs). The EU Council Regulation 428/2009 controls the export, transit and brokering of dual-use goods, software and technology which can be misused.

Dual-use research of concern

The term dual-use research of concern (DURC) applies to life sciences research knowledge, technology and material that could potentially be misused without further modification (immediacy) and that has a significant potential to cause serious harm (scope) to public health and safety, agricultural crops and other plants, animals, the environment, material or government security.

ECDC

The European Center for Disease Prevention and Control (ECDC) seated in Stockholm. The ECDC mission is to identify, assess and communicate threats to human health by infectious diseases.

ECHA

The European Chemicals Agency (ECHA) in Helsinki is the EU's agency for the implementation of EU chemicals legislation. It is responsible for implementing the 'Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals' (REACH).

ECURIE

European Community Urgent Radiological Information Exchange (ECURIE) - system for early notification and exchange of information in case of radiological or nuclear emergency. Nationally operated by a network of Contact Points (CPs) and Competent Authorities (CAs) via specific software (CoDecS).

EChemPortal

eChemPortal is a global Internet portal to information on chemical substances provided by the Organisation for Economic Co-operation and Development (OECD). Launched in 2010, a second version of the eChemPortal allows users to search by chemical identity and, in addition, provides new searches based on certain

properties or effects, such as physical chemical properties, environmental fate and behaviour, ecotoxicity and toxicity, in the participating databases which provide for direct searching of end-point data.

ERCC

See: Emergency Response and Coordination Center.

ERPG

Emergency Response Planning Guidelines (ERPG) are guidelines on air concentration for the protection of the general public against single exposures to agents. They are intended for use as tools to assess the adequacy of accident prevention and emergency-response plans. ERPG values are based on concentration ranges where it is reasonable to anticipate the observation of adverse effects; they should be applicable to most individuals.

The ERPG value is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour, without:

1. experiencing anything other than mild transient adverse health effects or perceiving a clearly defined objectionable odour (ERPG-1);
2. experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action (ERPG-2); or
3. experiencing or developing life-threatening health effects (ERPG-3).

ERPG are issued by the American Industrial Hygiene Association (AIHA).

See also: Exposure limits for chemicals.

ETW

'Einsatztoleranzwerte' – which means "concentration values that can be tolerated during fire-service response" – were published by the German Fire Protection Association (GFPA) in the document vfdb 10-01 'Evaluation of Harmful Concentrations in Fire Service Operations' (Guidelines of the Vereinigung zur Förderung des Deutschen Brandschutzes - vfdb). To date, ETWs have been developed for 44 substances, which can be measured by fire services using standard measurement equipment. They are intended for a maximum exposure period of four hours. As regards their objective of protection, they correspond with AEGL-2 values: irreversible or other serious, long-lasting effects or impaired ability to escape are not expected below the value.

See also: Exposure limits for chemicals.

EUCPM

See: European Union Civil Protection Mechanism.

Early warning system

Abbreviation: EWS. The system is part of the EU action plan on enhancing the security of explosives. The EWS is used to exchange information between authorities in different Member States on for example: immediate threats; theft of explosives; theft of detonators; discovery of new modus operandi, etc.

Ebola virus

Ebola virus and the closely related Marburg virus are highly contagious viruses of the family Filoviridae that cause viral hemorrhagic fever characterised by high fever, headache, respiratory symptoms, stomach pain, diarrhea, bleeding, and sometimes central nervous system involvement with coma. The symptoms that tend to follow include vomiting, rash, and bleeding problems that include bloody nose (epistaxis), spitting up blood from the lungs. Progressive organ failure leads to death. Ebola and Marburg hemorrhagic fevers are associated with a very high case fatality rate. The virus can be transmitted by secretions (by contact with blood, feces, or body fluids) of symptomatic patients. Worldwide is no treatment or vaccine available. Ebola and Marburg hemorrhagic fevers are zoonoses observed in Africa.

Molecular, serological, and virological studies imply that bats are the reservoir. The main source of human infections is the handling of infected primates. Based on the high mortality rate of the agents, they are considered as potential bioweapons.

Effect monitoring

Biological effect monitoring can be used to detect alterations of biological and biochemical or clinical markers in humans or animals occurring after a (potential) exposure to (unknown) infectious agents or toxins, or toxic chemical agents, indicating the presence of an infection, intoxication or disease. Effect monitoring is a component of biomonitoring and could complement exposure monitoring.

Effective dose coefficient

This parameter allows units of radioactivity intake to be transformed into effective doses. It takes into account radiation and tissue weighting factors, metabolic and biokinetic information. It is usually given for an integrated time of 50 years following intake (for adults) and 70 years for children.

Electron

A stable subatomic particle (elementary particle), which has a negative electrical charge.

Emergency

Sudden, urgent, usually unexpected occurrence or event requiring immediate action.

Note: An emergency is usually a disruption (3.70) or condition that can often be anticipated or prepared for, but seldom exactly foreseen.

[SOURCE: EN ISO 22300:2018 'Security and resilience — Vocabulary']

Emergency Response and Coordination Center

The Emergency Response and Coordination Center operated within DG ECHO, has been set up [as a 24/7] contact point to support a coordinated and quicker response to disasters. It collects and analyses real-time information on disasters, monitors hazards, prepares plans for the deployment of experts, teams and equipment, and works with Member States to map available assets and coordinate the EU's disaster response efforts by matching offers of assistance to the needs of the disaster-stricken country.

Emergency decontamination

The application of wet or dry decontamination techniques at the earliest opportunity before the local decontamination capability is available at the scene.

Emergency management

Overall approach for preventing emergencies and managing those that occur.

Note: In general, emergency management utilizes a risk management approach to prevention, preparedness, response and recovery before, during and after potentially destabilizing events and/or disruptions.

[SOURCE: EN ISO 22300:2018 'Security and resilience — Vocabulary']

See: Casualty decontamination, Cold zone, ECURIE, Emergency plan, ERPG, Generic Emergency Plan, Hot zone, Response, Response phase, Risk Control, Warm zone, Crisis management.

Emergency plan

A document or collection of documents that sets out the overall framework for the initiation, management, co-ordination and control of personnel and assets to reduce, control or mitigate the effects of an emergency.

Emergency services

Public services related to emergency preparedness and response that are provided by government institutions, non-governmental organizations or other agencies or organisations.

Emergency temperature

The temperature at which emergency procedures will be implemented in the event of a loss of temperature control during the transportation of radioactive material.

Empty package, RN

Refers to packaging, which had previously contained radioactive material and is in good condition and remains securely closed. The outer surface of any packaging for uranium or thorium is covered with an inactive sheath made from metal or another substantial material. The level of internal non-fixed contamination, when averaged over any area of 300 cm2, does not exceed 400 Bq/cm2 for beta and gamma emitters and low-toxicity alpha emitters and 40 Bq/cm2 for all other alpha emitters and any labels which may have been displayed and are no longer visible.

Emulsion explosive

Explosives in the form of emulsion. Relatively save to use and hard to initiate.

The primary use for emulsion explosives is for civilian use in the mining industry and during road and tunnel construction work.

Endemic

Endemic refers to a continuous presence of a disease or infectious agent, that occurs at a predictable rate, at low levels and with low prevalence in a population (human, animal or plant) or geographic region.

Endotoxin

Endotoxins are heat-stable molecules, mostly lipopolysaccharide complexes and part of the outer cell wall of especially gram-negative bacteria.

Endotoxins are not secreted like Exotoxins but mostly released upon destruction of the cell wall when the bacterium dies. Endotoxins are involved in septic shock.

See also: Toxin.

Energetic material

Energetic materials are defined as a class of compounds, substances and formulations containing a high amount of stored chemical energy, which may be manipulated to be released in a controlled manner. This would include, but is not limited to, materials such as explosives, propellants, pyrotechnics, and their ingredients.

Ensuring compliance

This is a systematic programme of measures for radioactive material, which are applied by a competent authority and intended to ensure compliance with the provisions of the ADR.

Enzyme

Is a protein that catalyses a chemical reaction of a substance (substrate) without being destroyed or altered. Enzymes increase the rate at which a chemical reaction occurs.

Epidemic

The occurrence of new cases of a certain disease in a given geographic area or in a given population during a given time period which exceeds the expected number of cases.

An epidemic is the rapid spread of an infectious disease in the population of a geographic area at a given time period.

See also: Outbreak.

Epsilon toxin

One of twelve Toxins produced by the bacteria Clostridium perfringens, which cause abdominal cramps, diarrhea and other intestinal illness symptoms. The spore-forming gram-positive bacterium is a relatively common cause of foodborne illness but can also be a natural component of the intestines of humans, other vertebrates or insects. The epsilon toxin is rarely seen in human foodborne infections, being more common in infections of sheep and occasionally goats and cattle, where it can produce a very severe often-fatal form of enterotoxaemia.

Equilibrium

A system is in equilibrium when the forward and reverse chemical reactions occur at equal rates.

Equivalent Dose, RN

This is a quantity used to measure and assess radiation damage to a specific tissue or organ resulting from a specific type of radiation. It is calculated by multiplying the absorbed dose by a factor, which is determined by the type of radiation. For example, a dose of 1 Gy absorbed by the bone marrow would result in an equivalent dose of 1 Sv, if the dose is delivered by gamma rays, and 20 Sv, if the dose is delivered by alpha particles.

European Chemical Substances Information System

Abbreviation ESIS, is the platform of the former European Chemicals Bureau (ECB) grouping several databases. Based on Directive 67/548/EEC, it enables users to search data using the CAS or EINECS number or the English name of the substance. This database provides information such as the European index number, information on certain legislations (biocides, import/export, etc.), scientific data from international programmes (High Production Volume Chemicals, IUCLID Chemical Data Sheets, IUCLID Export Files, OECD-IUCLID Export Files, EUSES Export Files, etc.) and classification according to the CLP Registration. ESIS will not be further developed.

European Explosive Ordnance Disposal Network

The European Explosive Ordnance Disposal Network (EEODN) is a network of law enforcement specialists in explosives and CBRN from the competent authorities of EU MS. Created by EUROPOL in 2008 in order to facilitate cooperation, to share technical and case related information among EU explosives and CBRN specialists and to organise joint trainings and exercises.

European Union Bomb Data System

The European Bomb Data System (EBDS) is a centralised database, which contains information on incidents related to explosives and CBRN materials. The system has also specialised libraries, where experts can share intelligence files and discussion forafora which enable direct interaction between experts.

Note 1: The EBDS provides access to relevant, specialised information from trusted, authoritative sources, including classified information.

Note 2: The EBDS is available in the EUROPOL secure network.

European Union Civil Protection Mechanism

The European Union Civil Protection Mechanism (UECPM) was established in 2002 under the umbrella of the European Commission DG ECHO in order to support member states and third parties by using the instruments mentioned below in major emergencies as well as in the preparation phase.

The UCPM includes the following instruments: European Emergency Response and Coordination Center (ERCC), expert teams (EUCPT), modules (stand-by emergency response units), the secure Common Emergency Communication and Information System (CECIS), the European Union Civil Protection Training Programme and the financial instrument.

European chemical numbers

Also referred to as European Community number, EC number, EC No., EC#, the European chemical number is a unique seven-digit identifier (with the format xxx-xxx-x) which is assigned to chemical substances for regulatory purposes within the European Union.

European civil protection teams

On request of the competent authorities of a country hit by a major emergency the ERCC can deploy an expert team known as European Civil Protection Team (EUCPT) to support on-site assessments and / or coordination actions. The Team members are trained by the European Civil Protection Training Programme to provide international expertise on the top of their national expertise. Depending on the mandate the team size can differ.

Evacuation

Organized, phased and supervised dispersal of people from dangerous or potentially dangerous areas to places of safety.

[SOURCE: EN ISO 22300:2018 'Security and resilience- vocabulary']

Evacuation shelter

Building in an area of relative safety providing basic temporary accommodation after an emergency.

Evacuee

Person removed from a place of actual or potential danger to a place of relative safety.

E**xcepted fissile**

This is a transport package with radioactive materials that satisfies one of the provisions for fissile-excepted material and so does not need to be treated as a fissile package. These are that:

- It does not contain more than 15 g of fissile material;
- It contains fissile material in a homogeneous hydrogenous solution or mixture in which the ratio of fissile nuclides and hydrogen is less than 5 % by weight; or
- There are no more than 5 g of fissile material in any 10-litre volume.

Excepted package, RN

This is a package that contains radioactive material below a certain activity and with a contact dose rate, which is less than 0.005 mSv/h.

Exclusive use, RN

This refers to the only use, by a single consignor, of a means of transport or large container for which all initial, intermediate and final loading and unloading are carried out in accordance with the instructions of the consignor or consignee. This type of transportation allows for some simplifications in the authorisation process or for a larger amount of transported activity.

See: Nuclear label III YELLOW.

Exempted package, RN

This refers to shipping methods and packaging for radioactive material with minimal activity and dose rate values. The 'exempted package' or 'exempt consignment' does not have to meet specific safety regulations.

Exogenous infection

Infection caused by organisms not normally present in the body and derived from the environment.

Exotoxins

Are complex polypeptides or proteins of some living microorganism, especially certain gram-positive or gram-negative bacteria. Exotoxins are often thermolabile molecules and they are not released upon cell death like Endotoxins but secreted or excreted in the surrounding medium by the living cell.

See: Toxin.

Expelling charge

Projectile ammunition is ejected from its weapon by means of a propelling or expelling charge. An expelling charge is only used to expel the projectile from the barrel without providing continued propulsion after it has left the barrel.

See: Commission Directive 2004/57/EC.

Explosion

Explosion is a rapid expansion of matter caused by release of mechanical, thermal, chemical or nuclear energy.

Explosion danger area

The explosion danger area needs to be assessed whenever an explosive (or potentially explosive) device is found. The explosion danger area depends on the amount of explosive. The danger area needs to take into account the pure blast effects (shock wave) as well as the effects of a fragmenting charge (shrapnel). The explosion danger area is larger for a larger amount of explosive as well as for a fragmenting charge.

Explosive

Is a reactive compound or the mixture of compounds that contains energy that can produce an explosion when released quickly, usually accompanied by the production of light, heat, sound, and pressure (see explosion). During the explosion large amounts of gases are formed.

The explosive normally carries both the fuel and oxidizer needed for the process.

There are three necessary components for an explosion to occur;

1. Flammable Substance – this needs to be present in a relatively high quantity to produce an explosive mixture (e.g. gas, vapours, mists and dusts).
2. Oxygen – oxygen is required in high quantities and in combination with the flammable substance to produce an explosive atmosphere.
3. Ignition Source – a spark or high heat must also be present.

Explosive detection dogs

Explosive Detection Dogs (EDD) are dogs trained for the detection of explosives and are used as a mobile detector with a unique capability to find the source, thanks to their strong sensitivity to odors (1,000 to 10,000,000 times higher than that of human being) is explained by the presence of 300 million olfactory receptors that line their nostrils, against 6 million in human being. However, canine detection has limitations in terms of not being able to communicate an identification of the substance detected.

EDDs are allowed as a screening method for screening of persons, cabin baggage and hold baggage and cargo in civil aviation. They are also frequently used in infrastructure protection.

Explosive ordnance disposal

Explosive Ordnance Disposal (EOD) is a process by which an explosive device is rendered safe. This is performed by specially trained EOD personnel.

Explosive strength

Is capability of the explosive to do work. This parameter mostly relates to industrial explosives used for blasting.

Explosive trace detector

Explosive trace detector (ETD) is a common name for explosives detectors specifically targeting detection of the small traces of explosives normally available after handling explosives or around a packaged explosive charge. These traces can be available in the form of vapours or particles.

Explosive train

The function of the explosive train is to accomplish the controlled augmentation of a relatively small explosive impulse into one of sufficient energy to reliably initiate a main charge.

Explosives detection systems

Abbreviation: EDS. Within aviation security today normally meaning X-ray screening equipment for hold baggage (also called check-in baggage).

Explosives precursor

A chemical reactant that takes part in the production of a home-made explosive.

Explosives safety

Refers to the prevention of accidents and, where prevention fails, the containment of their effects.

Exposure limits for chemicals

Occupation safety limits defined by various worker protection organisations for chemical exposures

Note 1: Common occupation safety limit values for workers are TVL, PEL, REL, IDLH.

Note 2: Specific exposure limits for general public protection against accidental releases are AEGL, SPEGL, ERPG and TEEL. These values are most commonly used in emergency planning or civil protection.

Exposure monitoring, biological

The purpose of exposure monitoring is to diagnose or rule out an infection or intoxication as soon as possible after a potential exposure to a biological agent. Depending on the infectious agent or toxin, targeted investigations can be applied like determination of genetic material of a pathogen or antibodies, or detection of the toxin. The aim of exposure monitoring is to intervene much earlier in the progression from exposure to disease.

See also: Incubation period.

Note: Exposure monitoring can be complemented by effect monitoring and biomonitoring.

FFP Masks

Filtering Facepiece Particle (FFP) masks are respiratory protection of high quality against dust, solid particles and liquid aerosols, which could contain infectious agents.

Note: FFP masks are available in three protective levels (FFP-1, FFP-2, FFP-3), with FFP-3 masks providing the highest level of filtering capability.

False alarm rate

The False Alarm Rate (FAR) of a detection instrument is a measure of its likelihood to make a false positive (see sensitivity of an detection equipment) identification of of another substance (could be innocuous one) that the one that is targeted as threat agent.

Fentanyl derivatives

Fentanyl, an opioid, is a standard drug used in anesthesia and emergency medicine. It has long been used for narcosis and pain management, and more than a dozen derivatives have been developed, such as carfentanylincluding for veterinary purposes. It is widely assumed, that a “fentanyl derivative” was used as a knockout gas during the Moscow theatre siege on 23 October 2002.

Field methods

or on-site methods, are methods employed when using mobile, mainly hand-held instruments. Mobile instruments offer flexibility of measurement in field conditions and performance. These instruments must be easy to operate to enable the detection of unknown compounds in a few minutes.

First responder

Certified member of an authority with responding first to the scene of an emergency.

Note: First responders are members of fire and rescue departments, police departments, other law enforcement agencies, hazardous materials response teams, emergency medical services, workers, and other organizations that have public safety responsibilities and who would respond to rescue and treat victims, and who would protect the public during an incident.

[SOURCE: CEN standard EN 17173: 2020 ‘European CBRNE Glossary’]

See: Frontline officer.

Fissile material

A nuclear material in which nuclear fission can be induced by neutrons, like uranium 233, uranium 235, plutonium 239 and plutonium 241.

As this kind of material, under specific conditions, can lead to the creation of a nuclear chain reaction, it is of paramount interest in nuclear engineering and also for illicit purposes.

Fissionable material

A nuclear material in which nuclear fission can be induced by neutrons whose energy exceeds specific thresholds, like uranium 234, uranium 238, plutonium 238 and plutonium 240.

Flammability

Ability of a material or product to burn with a flame under specified conditions.

[SOURCE: ISO 13943:2017 Fire Safety- Vocabulary]

Note: The United Nations created "The Guide to The Globally Harmonized System of Classification and Labelling of Chemicals " defines the flash point temperature of flammable liquids as between 0 and 140 °F (60 °C) and combustible liquids between 140 °F (60 °C) and 200 °F (93 °C).

Flammable

Combustible which ignites easily and burns rapidly with a flame, or a combustible with a flash point below an arbitrary temperature limit of 37,8 °C (100 °F).

See: Combustible, Flammability.

Flash cartridges

Consist of a casing, a primer and flash powder, all assembled in one piece ready for firing.

Flash fire

Fire that spreads rapidly through a diffuse fuel-air mixture without the production of damaging pressure.

Flash powder

Flash powder is a pyrotechnic composition used to produce a strong flash and high sound. It contains an oxidizer and metal powder. This composition is normally very sensitive to mechanical stimuli and static electricity.

Flashpoint

The flashpoint of a volatile substance is the lowest temperature at which it can vaporize to form an ignitable mixture in air. Measuring a flash point requires an ignition source. At the flash point, the vapour may cease to burn when the source of ignition is removed.

The flash point is not to be confused with the auto ignition temperature or the fire point (the temperature at which the vapour continues to burn after being ignited).

Food terrorism

An act or threat of deliberate contamination of food and feed with chemical, biological or radio nuclear agents for the purpose of causing injury or death to civilian population and/or disrupting social, economic or political stability.

Foot-and-mouth disease

Foot-and-mouth disease (FMD) is caused by a member of the picornavirus family. It is a highly infectious and sometimes fatal viral disease in susceptible animals: cattle, water buffalo, sheep, goats, pigs, antelope, deer and bison. Clinical symptoms are high fever lasting for two or three days, followed by blisters inside the mouth and on the feet. FMD has a severe economic impact on animal farming.

Forensic sampling

Forensically acceptable techniques to identify CBRN hazards and to confirm, by the unequivocal use of CBRN agents by an adversary.

Note: As the proof of use of CBRN agents is such that it cannot be refuted, this degree of certainty cannot be achieved by information obtained solely from field sampling or unusual numbers of casualties. In such a case, additional forensic support for securing crime scene evidence is required.

[SOURCE: CEN EN 17173:2020 'European CBRNE Glossary']

Formulation

An explosive is normally formulated with other substances like binders and plasticisers to achieve a composition with the appropriate properties for a certain application. Also Home-made explosives may be formulated which means that the explosive is not necessarily found in its pure form making it harder to recognize.

Forward command post

Or forward command point. Any agency's command and control facility nearest the scene of the incident, responsible for immediate direction, deployment and security. This may be either operational or tactical depending on the circumstances of the incident.

Fourier transform infrared spectrometer

Abbreviation: FTIR spectrometer.

Infrared spectroscopy instruments use the absorption spectrum as a function of wavenumber (cm-1) that is obtained from Fourier transform (kind of mathematical calculation, in this case used for better performance of analyse) of the interferogram. Used in chemical and material analysis.

Fragmentation, explosives

Process of shattering by the explosion of ammunition projectile or IED container to produce fragments that could harm humans, animals or destroy stuff in proximity of the explosion.

Francisella tularensis

Gram negative Bacteria, cause of the disease tularaemia, which can affect humans and animals (especially rodents, rabbits and hares). Transmission routes are cutaneous/ocular (skin and/or eye contact with bacteria), pulmonary (inhalation of bacteria) or oral (ingestion of bacteria). Symptoms depend on transmission routes and affect mainly the site of entry. Systemic infections (e. g. after ingestion or inhalation) show a higher fatality rate. Transmission by insect bites is relevant. No known transmission between humans. Two types of Francisella tularensis are relevant for human infections: Francisella tularensis biovar tularensis (type A) (Northern America), responsible of the most serious pulmonary form, and Francisella tularensis biovar palaearctica (type B) (worldwide). Infections with type A are the more severe disease. Ciprofloxacine, streptomycin and doxycycline are first-line antibiotic treatment and post-exposure prophylaxis. A vaccine against tularaemia does exist and is authorised in a few countries (e.g. Russia) but availability is limited.

See also: Tularemia.

Freezing point

This is the temperature at which a liquid turns into a solid. Depends on the pressure.

See also: Melting point.

Fuel

A substance that releases energy either through:

a. an oxidation-reduction reaction between fuel and an oxidiser. This reaction is characterized by the release of heat and often a high volume of gaseous products. A very rapid reaction is called deflagration or detonation (2 types of the explosion).

b. or, a nuclear reaction such as fission or fusion.

See also: Nuclear fuel.

Fumigation

To eliminate pests within an area or room (e.g. transport container, bulk carrier or houses), gaseous pesticides could be used. Regarding international transport of goods, fumigation is an option to prevent the spread of diseases and insects according to the International Standards for Phytosanitary Measures No. 15 (ISPM 15) issued by the Food and Agriculture Organization (FAO) of the United Nations.

Note 1: A fumigated road-, rail-, waterway- and air transport cargo unit is flagged with a warning tag as specified in the dangerous goods regulation. This covers road, rail, waterway and air transport.

GC-MS

This is a combination of two different analytical techniques: a gas chromatography (GC) instrument with a mass spectrometer (MS). The gas chromatograph separates the volatile and semi-volatile compounds of the chemical mixture into pulses of pure chemicals and the mass spectrometer identifies (by providing detailed structural information, including the full unambiguous chemical structure thank to MS impact electronic and chemical ionization modes) and quantifies the individual chemicals.

GHS

The Globally Harmonized System of Classification and Labelling of Chemicals (GHS) classifies chemicals by types of hazard and proposes harmonised hazard communication elements, including labels and safety data sheets. It aims to ensure the availability of information on physical hazards and toxicity from chemicals so as to enhance the protection of human health and the environment during the handling, transport and use of such chemicals.

The GHS also provides a basis for the harmonisation of rules and regulations on chemicals at national, regional and worldwide level, which is important to facilitate trade, too. It aims to apply consistent classification criteria, hazard classes and categories, and elements of hazard communication (labels) at a global level.

GHS labels

According to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), hazard labels are diamond-shaped squares with a red margin and containing a hazard symbol. The labels are accompanied by signal words such as 'danger' or 'warning' and hazard statements like 'FLAMMABLE'.

GIS

Geographic information system, a computer based system that supports the capture, management, analysis and modelling of geographically referenced data.

Gamma radiation

Gamma rays are a type of ionizing radiation, which may be emitted in the process of spontaneous disintegration of unstable atomic nuclei, usually accompanying other decays.

Gamma photons have about 10,000 times as much energy as the photons in the visible range of the electromagnetic spectrum. Because of their high energy they can travel hundreds to thousands of meters in air before being absorbed. They can pass through many kinds of materials, including human tissue. Very dense materials, such as lead, are commonly used as shielding to slow or stop gamma photons.

Gas chromatography

Gas chromatography (GC) is a laboratory technique used for substances, which are sufficiently thermally stable and vaporisable without decomposition. The sample is transported through the column by the flow of an inert, gaseous mobile phase (driven by flowing carrier gas). The column itself contains a liquid or polymer on an inert solid support as stationary phase. For the same analytical conditions, the time required for passing through a column (i.e. retention time) varies according to each chemical substance. The column is connected to the detector, which is able to determine the response of the signal (when separated compound is present in the detector) according to the retention time.

Geiger–Müller tube

The Geiger–Müller tube (or G-M tube) is the sensing element of the Geiger counter instrument used for the detection of ionizing radiation. It is a type of gaseous ionization detector and it is a simple instrument used for the detection of gamma radiation, X-Rays, and beta radiation.

General infection

See: Systemic infection.

Generic emergency plan

A single emergency plan developed to enable an organisation's response to emergencies arising from a wide range of risks.

Genetically modified organisms

(GMO), Organisms whose genetic material has been altered, for example by using genetic engineering techniques, in a way that does not occur naturally by mating and/or natural recombination.

Glanders

Infectious disease primarily of horses, mules and donkeys (and can be naturally contracted by other mammals such as goats, dogs, and cats) caused by the bacterium *Burkholderia mallei*.

Global Maritime Distress and Safety System

Internationally agreed set of safety procedures, types of equipment, and communication protocols used to increase safety and make it easier to rescue distressed ships, boats and aircraft.

Gray

The gray (Gy) is the SI unit of absorbed radiation dose due to ionizing radiation (1 Gy = 1 J/kg).

Gulf war syndrome

Gulf War syndrome (GWS) or Gulf War illness (GWI) is a chronic multi- symptom disorder affecting returning military veterans and civilian workers of the Gulf War. A wide range of acute and chronic symptoms have been linked to it, including fatigue, muscle pain, cognitive problems, rashes and diarrhea.

HAZMAT

See: Hazardous materials.

HPLC

High-performance liquid chromatography instruments consist of a reservoir of mobile phase, a pump, an injector, a separation column, and a detector. It involves the separation of different components in a sample mixture according to their distribution between the stationary and mobile phase, which is always liquid. Unlike conventional column chromatography, an HPLC instrument operates with a powerful high-pressure pump which permits the flow of the mobile phase through small columns.

This method is suitable for analysing less-volatile organic liquids and solids that are soluble in water, in organic solvents or in diluted acids.

HPVC

The Organisation for Economic Co-operation and Development (OECD) defines high production volume chemicals (HPVC) as chemicals placed on the market in volumes greater than 1000 tons per year in at least one member country or region, and provides an OECD list of HPVC, which was last updated in 2004.

The European chemical Substances information System (ESIS) lists 2782 HPVCs.

Hemorrhagic fever viruses

The term summarises viruses, which are able to induce hemorrhagic fevers (also called viral hemorrhagic fevers) in humans or animals. They are grouped together on the basis of the clinical symptoms (fever and bleeding and coagulation disorders) induced by the viruses. While some types of hemorrhagic fever viruses can cause relatively mild illnesses, many of these viruses cause severe, life-threatening disease.

According to WHO, Viral hemorrhagic fever is a general term for a severe illness, sometimes associated with bleeding, that may be caused by a number of viruses. The term is usually applied to disease caused by arenaviruses i.e. Arenaviridae (Lassa fever, Junin and Machupo), bunyaviruses i.e. Bunyaviridae (Crimean-Congo hemorrhagic fever, Rift Valley Fever, Hantaan hemorrhagic fevers), filoviruses i.e. Filoviridae (Ebola and Marburg) and flaviviruses i.e. Flaviviridae (yellow fever, dengue, Omsk hemorrhagic fever, Kyasanur forest disease).

Viruses associated with most VHFs are zoonotic.

Half-life

1. (radioactivity)

The time in which one half of the atoms of a particular quantity of radioactive elements decay, measured in time units (seconds, days, years and millenniums).

2. (biological)

The time in which one half of the amount or titre of a given pathogen (bacteria or virus) or toxin has lost its infectivity or toxicity, respectively. Half-life time is dependent on environmental conditions (like temperature, protein concentration and pH).

Hand grenade

A military weapon (ammunition) that is thrown by hand with the main effects to produce high energy fragments or overpressure damage. A variety of types of hand grenades exists, the most common being explosive grenades designed to detonate after a set amount of time or after impact. Other type of hand grenade could contain incendiary materials, smoke generators, tear substances, etc.

Hand-held detectors

See: Field methods.

Hazard

Source of potential harm.

Note: Hazard can be a risk source.

[SOURCE: ISO/Guide 73:2009, 3.5.1.4]

See: All hazards.

Hazard assessment

The determination of whether hazards for health, equipment, infrastructure or environment are present or are likely to be present.

Hazard identification

Process of identifying, characterizing and validating hazards.

Hazard identification number

Also called the Kemler number, this first figure in this two or three digit number indicates the primary hazard:

- 2 - Emission of gas due to pressure or chemical reactio
- 3 - Flammability of liquids (vapours) and gases or self-heating liquid 4 Flammability of solids or self-heating solid
- 5 - Oxidising (fire-intensifying) effect 6 Toxicity
- 7 - Radioactivity
- 8 - Corrosivity
- 9 - Risk of spontaneous violent reaction

The doubling of a figure indicates an intensification of that particular hazard. Where the hazard associated with a substance can be indicated adequately by a single figure, this is followed by a zero. A hazard identification number, which is prefixed by the letter 'X', indicates that the substance will react dangerously with water. The hazard identification number is found on tank vehicles as the upper number on the numbered 'orange plate' or in the transportation document and HAZMAT database information.

Hazard statements

These form part of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). They are intended to form a set of standardised phrases about the hazards of chemical substances and mixtures, which can be translated into different languages. As such, they serve the same purpose as the risk phrases (R-phrases), which they are intended to replace.

Hazardous material

A hazardous material or HAZMAT is defined as any substance or material could adversely affect the safety of the public, handlers or carriers or the environment.

Hazchem

This warning-plate system is used in the United Kingdom, Australia, Malaysia and New Zealand on vehicles transporting hazardous substances, and for storage facilities. The first line includes an emergency action code (EAC) comprising a single number (1 to 4, representing the type of fire suppressant) and either one or two letters (representing the required type of PPE, containment measures and the possibility of violent reactions). The second line contains the UN number, the third line gives a telephone number for specialist advice, and a warning symbol is also displayed on the plate.

Health **effects of chemicals**

Possible consequences of exposure of humans to chemical substances include:

1. illness due to interference with biological processes (poisoning);
2. damage due to destruction of body tissue (corrosion/irritation);
3. sensitisation of skin or respiratory organs;
4. induction of cancer (carcinogenicity);
5. damage to the genetic information in egg and sperm cells (germ cell mutagenicity); and
6. impaired ability to create offspring or damage to the unborn child (reproductive toxicity or 'reprotoxic').

Substances with have one or more of the latter three properties are also grouped as CMR substances.

Hexamethylenetetramine

Chemical formula C6H12N4, CAS number 100-97-0 Hexamethylenetetramine (HMT, urotropine) is a heterocyclic compound and has many applications in chemistry (e.g. for preparation of resins, explosives); it is used as a food additive, medicament and in the form of tablet as a solid fuel for campers (in this form is available for general public).

High consequence dangerous goods

These are goods which have the potential for misuse in a terrorist event and which may, as a result, produce serious consequences such as mass casualties, mass destruction or, particularly in the case of radioactive material, mass socio-economic disruption.

High explosive

High explosives (HE) are detonable energetic materials.

Note: low explosive burns very rapidly (it deflagrates not detonate).

High-activity sealed source

A High-activity sealed source (HASS) is a source containing a radionuclide whose activity at the time of manufacture or – if this is not known – of the first placing on the market exceeds specific thresholds.

Home-made explosives

Home-made explosives (HMEs) are commonly encountered in IEDs. There are mainly two categories that prepare and/or use HMEs. HMEs can be made from many different precursors that some of them may be innocuous in themselves and easily accessible.

Note: Many homemade explosives are very sensitive to handle.

Host

Hosts are organisms (humans, animals or plants) that can be infected by an infectious agent under natural (as opposed to experimental) conditions.

Hot zone

Biological and chemical emergencies

Hot zones are the contaminated areas where the initial release occurs or disperses to. It will be the area likely to pose an immediate threat to the health and safety of all those located within it.

Radiological emergencies

A hot zone is defined by the radiation exposure level (> 0.1 mSv/h).Hot zone is an area around dangerous radioactive source where precautions should be taken to protect the responders and the public from potential external exposure and contamination.

Source: Definition by IAEA.

Hydrogen chloride

Synonym: hydrochloric acid, anhydrous; Formula: HCl, CAS No 7647-01-0.

Hydrogen chloride is a colourless gas with a strong irritating odour. Upon contact with atmospheric humidity it forms white fumes of hydrochloric acid solution foam. A solution of hydrogen chloride in water is also commonly called hydrochloric acid, and uses the formula HCl. Hydrogen chloride gas is produced in large quantities (HPVC) and is used in the production of numerous chemicals such as colorants and polymers. On a large scale it is also used for the surface treatment of metallic materials.

See also: Pulmonary agents (choking agents according to OPCW).

Hydrogen cyanide

Synonym: hydrocyanic acid, prussic acid, Formula: HCN. CAS No 74-90-8.

Extremely toxic chemical compound. Liquid in normal temperature but boil in 25, 6 °C. The pure chemical is a colourless liquid, while technical-grade products are dark brown. It smells of 'bitter almonds'. Hydrogen cyanide is a toxic industrial chemical (TIC). It is listed on Schedule 3 of the Chemical Weapons Convention.

Note 1: All production sites manufacturing more than 30 tonnes per year must be declared to the OPCW. The code name of the chemical warfare agent is AC.

Note 2: LCt50: 5000 mg.min/m3; LD50 on skin: 100 mg/kg.

See also: Cyanides, TIC.

Hydrolysis

The reaction of a compound with water whereby decomposition of the substance occurs. New substances (hydrolysis products) form when a compound reacts with water.

Hygiene

In general, hygiene is defined as a concept that helps people to be and stay healthy. In the context of infectious diseases, hygiene means the compliance to measures to prevent the spread of infectious agents, like hand hygiene, decontamination, disinfection and sterilisation.

IAEA

The International Atomic Energy Agency (IAEA) is an UN organization that seeks to promote the safe, secure and peaceful use of nuclear energy, and to inhibit its use for any military purpose, including nuclear weapons. Though established independently of the United Nations through its own international treaty, the IAEA Statute, the IAEA reports to both the UN General Assembly and Security Council.

ICP-MS

Inductively coupled plasma mass spectrometry(ICP-MS) is one of the most sensitive analytical laboratory techniques for detecting and analysing trace and ultra-trace elements. This method can be used for the determination of most elements to concentrations of parts per trillion (ppt) 10^{-12}.

IDLH

Immediately Dangerous to Life or Health is a reference threshold defined by the US National Institute for Occupational Safety and Health (NIOSH). IDLH refers to the highest airborne concentration from which a person could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects. Other than for ERPG or AEGL thresholds, no severity levels are defined.

See also: Exposure limits for chemicals.

IED

Improvised Explosive Device (IED) is explosive device produced by the non-authorized person and without security and quality standards applicable on industrial explosive device production.

An IED is a unique bomb constructed typically from whatever available explosives, an ignition system, a detonator, electronics, power source and a container and are used an improvised manner. It is mainly produced and used by terrorist or organized crime members.

INES

The International Nuclear and Radiological Event Scale(INES) is a tool for promptly communicating to the public, by means of consistent terms, the safety significance of reported nuclear and radiological incidents and accidents, excluding naturally occurring phenomena.

Igniter

An igniter is a device, which is used to initiate an explosive reaction. An igniter can be based on non-explosive stimuli like friction, heat or electricity and initiate the explosive train. A igniter consists of a metal cylindrical capsule normally containing a primary explosive and a secondary charge The igniter is part of the ignition system.

Igniter cord

Igniter cord is a strong, flexible plastic tube containing a core of pyrotechnic composition encased in a textile outer jacket and a plastic coating. It burn with the constant speed along its length with external flame and is used to transmit ignition.

Ignition system

The ignition system provides the initiation of an explosive.

Illi**cit trafficking of RN materials**

The unauthorized acquisition, receipt, possession, use, transfer, import, export, trade, brokerage or disposal of nuclear materials and other radioactive sources, whether intentional or unintentional and with or without crossing international borders.

This is true also for chemical and biological substances, thus the definition should be extended to the C and B fields.

Impact

The scale of the consequences of a hazard, threat or emergency expressed in terms of a reduction in human welfare, damage to the environment, food production and loss of security.

Improvised explosive device

See: IED.

Improvised explosives

See: Home-made explosives.

Improvised incendiary device

IID – improvised – non professional device produced for make fire for criminal purpose.

IIDs often contain flammable liquids, pyrotechnic mixture or incendiary chemicals.

Improvised nuclear device aka Improvised nuclear explosive device

Device built from components of a stolen weapon or illegally obtained fissile nuclear weapons material that produces a nuclear explosion. It can produce same physical and medical effects as nuclear weapon.

Incendiary ammunition

Incendiary ammunition contains an incendiary substance.

Incident

Event or situation that requires a response from the emergency services or other responders. This definition is not applicable for radiological or nuclear incidents.

Incident commander

A person who exercises authority within their organisation, to provide the overall co-ordination and direction in order to achieve defined objectives at a specific incident.

Incubation period

The time from the moment of exposure to an infectious agent until the appearance of symptoms and/or clinical signs of the disease.Incubation period is the time elapsed between exposure to a pathogenic organism, a chemical, or radiation, and when symptoms and signs are first apparent.

Note: In a typical infectious disease, incubation period signifies the period taken by the multiplying organism to reach a threshold necessary to produce symptoms in the host. Depending on the disease, the person may or may not be contagious during the incubation period.

See also: Ebola.

Industrial package

Packages used to transport low specific activity (LSA) radioactive material LSA and surface contaminated objects (SCO). There are three types of industrial packaging – Type IP-1, Type IP-2 and Type IP-3 – which are used for shipments of LSA and SCO. The requirements packaging must meet to be classified as industrial packaging are not demanding. In fact, many packages normally used in industry, such as steel drums or barrels, meet those requirements.

Infection

Invasion with subsequent multiplication of microorganisms such as bacteria, viruses, and parasites that are not normally present in a host organism, causing a symptomatic or asymptomatic, but verifiable reaction like immune response. These infectious organisms are known as pathogens. Infections can be classified according to the route of infection, the origin of the infection and the course of the infection. An infection may remain localised, or it may spread through the blood or lymphatic vessels to become systemic (body-wide).

Infection control

Procedures and techniques in order to reduce the spread of infection (in particular nosocomial infections). The basic principle of infection control is hygiene.

Infection control addresses factors related to the spread of infections after an incident in a laboratory (e.g. laboratory acquired infection), or within the healthcare setting (whether patient-to-patient, from patients to staff and from staff to patients, or among-staff), including prevention (via hand hygiene/hand washing, cleaning/disinfection/sterilization, vaccination, surveillance), monitoring/investigation of demonstrated or suspected spread of infection after an incident in a laboratory, or within a particular health-care setting (surveillance and outbreak investigation), and management (interruption of outbreaks).

The best wording is much more: “infection prevention and control”.

Infectious agent

The term infectious agent summarises bacteria, viruses, fungi, prions, protozoa, parasites and biological toxins which are able to infect humans, animals and plants and have the potential to induce disease. Agents might be derived from the environment (e.g. soil or water) or transmitted from infected humans or animals.

The number, route, mode of transmission, and stability of an infectious agent outside the host determines its infectivity.

Infectious dose 50%

Infectious dose 50% (ID50) is the amount of a pathogen (measured as quantity or concentration) required to cause an infection in half of the (experimentally) exposed hosts by a given route, and after specified test duration. The number, route, mode of transmission, and stability of an infectious agent outside the host determines its infectivity.

See also: Lethal dose, LD50.

Infrared spectroscopy

Infrared spectroscopy is analytical technique, based on measurement of the absorption of infrared radiation by the sample. It is intended primarily for the identification and structural characterisation of organic compounds as well as the determination of inorganic substances. A common laboratory instrument using this technique is a Fourier transform infrared (FTIR) spectrometer.

Inhibitor

A chemical inhibitor is a substance that decreases the rate of, or prevents, a chemical reaction; in the CBRNE context especially one that prevents the use of precursors for the production of home-made explosives or toxic chemicals.

Initiating efficiency

Is the ability of primary explosive to initiate detonation in a secondary explosive adjacent to it.

Initiation

Initiation is the beginning of a deflagration or detonation of explosives.

Inner cordon

Or Inner Perimeter or Inner Safety Cordon / Perimeter. Surrounds the area where potentially hazardous activity may be safely conducted only by responders wearing appropriate personal protective equipment. It encompasses the hot and warm zones.

See also: Outer cordon.

Inorganic compounds

An inorganic compound is any compound lacking carbon atoms (or, if carbon is present, it is bound in ionic form to other atoms). Water (H2O) or calcium carbonate (CaCO3) are examples of inorganic compounds.

Interferent

Interferents (or interferences) are chemicals that may interfere with the detection of explosives using a trace detection system. They can do this by e.g. giving rise to false positives (see selectivity of detection equipment) when no explosive is present.

Interference occurs when a substance or process falsely alters an assay result.

International Chemical Safety Cards

Abbrevation: ICSC. They summarise essential health and safety information on chemicals for their use on the 'shop-floor' level by workers and employers in factories, agriculture, construction and other workplaces. They are not legally binding documents, but comprise a series of standard phrases mainly summarising health and safety information which has been collected, verified and peer reviewed by internationally recognised experts, taking into account advice from manufacturers and poison control centers.

Identification of the chemicals on the ICSC is based on the UN numbers, the CAS numbers and the Registry of Toxic Effects of Chemical Substances (RTECS/NIOSH) numbers.

International Convention for the Suppression of acts of Nuclear Terrorism

Under this UN Convention of 2005, States have an obligation to criminalize a wide range of activities involving nuclear or other radioactive material.

Article 2.1 establishes as offences the unlawful and intentional possession, use, threat, attempt or participation in acts involving radioactive material (in this convention, radioactive material includes nuclear material) with the intent to cause death, serious bodily injury or property damage. The convention sets up coordination rules for criminal proceedings, evidence exchange, and post crisis management.

International Health Regulations

The International Health Regulations (IHR) constitute an international legally binding instrument of the World Health Organization (WHO). The current version entered into force on 15 June 2007 (adopted 2005). The purpose and scope of are to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade (Art. 2, IHR 2005).

International vehicle registration

Refers to an international registration code allocated to vehicles for identification purposes, as prescribed in the Vienna Convention on Road Traffic (Vienna, 1968). It indicates the code assigned to vehicles travelling internationally by the competent authority of the country issuing the certificate of approval for a container.

Intoxication

Is the poisoning by a toxic substance.

See: Poison control center.

Intoxication, foodborne

Illness resulting from ingesting toxin-containing food. Typical foodborne biotoxins include botulinum, staphylococcal, Bacillus cereus and Clostridium perfingens toxins, as well as marine biotoxins. It may be also Bacillus anthracis toxins (i.e. Gastrointestinal anthrax is caught from eating meat from an infected animal. It causes initial symptoms similar to food poisoning, but these can worsen to produce severe abdominal pain, vomiting of blood and severe diarrhea).

Bacteria and viruses that are the most common cause of food poisoning can be Campylobacter, Escherichia Coli, Listeria, Norovirus, Salmonella, hepatitis A, Shigella, Staphylococcus aureus, Vibrio Species Causing Vibriosis.

Invacuation

Sheltering of people and (where appropriate) other living creatures inside a building or structure within an area of actual or potential danger to reduce their risk of harm.

Iodine prophylaxis

The administration of potassium iodate/iodide in a timely manner, which protects the thyroid of persons close to a serious nuclear accident caused by emissions of radioactive Iodine 131, the uptake of radioiodine by inhalation of contaminated air or ingestion of contaminated milk or other food.

Potassium iodate/iodide acts by blocking the thyroid's ability to absorb the radioactive iodine 131 which may be inhaled or ingested.

Ionisation chamber

Is a type of radiation detector which can be used for measuring the intensity of a beam of radiation or for counting individual charged particles.

Ionizing radiation

This is radiation capable of producing ions. It has enough energy to remove tightly bound electrons from an atom's orbit causing the atom to become charged or ionised. Examples include alpha and beta particles, gamma rays, X-rays and neutrons.

See: Alpha radiation, beta radiation, gamma radiation.

Irradiated fuel

This is nuclear material which has been used in a nuclear reactor and has completed its cycle, thereby becoming highly radioactive.

Irradiation

In the case of ionising radiation, this refers to the transfer of energy from a radiation source or radioactive substance to the human body or another material.

Isolation

Separation of ill persons or suspects of illness due to a communicable disease from those who are healthy. Isolation restricts the movement of ill persons to help stop the spread of certain diseases, enables appropriate medical treatment and prevents the spread of the agents to the medical staff or other patients or to the general population.

See also: Person likely to be infected.

Isotope

Isotopes are different components of an element's family, which share the same number of protons in their nuclei but a different number of neutrons. Isotopes of the same element have identical chemical properties. However, some of them decay and emit radiation.

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management – IAEA – 1997 Covers management, transboundary movements, disposal of spent fuel and spent radioactive waste from civilian reactors and some military or defence programmes.

Each country has a regulatory body for the implementation. Emergency plans are set up.

Kelvin

This thermodynamic (absolute) temperature scale is expressed in Kelvin (K). The Kelvin and Celsius scales are defined using absolute zero (0 K) and the triple point of water (273.16 K). The triple point is determined by temperature and pressure at which the three phases (gas, liquid and solid) of that substance coexist in thermodynamic equilibrium, e.g. the triple point of water is 0.01°C with a vapour pressure of circa 6.1173 millibars. The relationship between both scales is expressed by the equation:

°C = K – 273.15 or K = °C + 273.15

Common mistakes is expressing Kelvin degree - Kelvin degrees does not exist, it should be used just Kelvin.

Kemler

Kemler Number or Kemler Code.

See: Hazard Identification Number.

LAG

Abbreviation for liquids, aerosols and gels.

Following the terrorist attempts to blow up several aircraft during flight using home-made explosives in 2006, the European Commission adopted additional rules on aviation security to address this newly-identified threat. New rules restrict passengers on carrying liquids, aerosols and gels (LAGs) past screening points, whether on their persons or in their hand luggage.

These rules are envisaged a temporary restriction to be lifted when suitable technology to screen liquids for explosives becomes readily available.

LC50

LC50 (Lethal concentration 50%) is the concentration of a gas or vapour in air or substance in water required to cause death in half of the (experimentally) exposed hosts during the observation period (i.e. for a set period of time --usually 4 hours--).

See: Lethal dose.

LCt50

'Concentration time' Ct is used as a measure for the exposure to (or dose of) an aerosol or vapour.

LCt50 is the concentration time which kills 50 % of an exposed population. It is usually expressed in time (minutes) multiplied by concentration (milligrams per cubic metre): mg. min/m3.

See also: Toxicity.

LD50

LD50 (Lethal dose 50%) is the amount required to cause death in half of the (experimentally) exposed hosts. It is a standard measurement of acute toxicity and is given in milligrams per kilogram bodyweight: mg/kg. LD50 is also called median lethal dose. Lethal dosage often varies depending on the route of administration (i.e. inhalation, oral, percutaneous, intravenous). For this reason, LD50 figures are often qualified with the mode of administration, e.g., "LD50 i.v."

See: Lethal dose.

LPVC

Chemicals placed on the market in volumes between 10 tons and 1000 tons per year per producer/importer.

[SOURCE: Organisation for Economic Co-operation and Development (OECD)]

See also: HPVC.

Labels

See: ADR labels, CLP Regulation, GHS labels, Hazard identification number, Hazchem, Nuclear label I white, Nuclear label II yellow, Nuclear label III yellow, Nuclear label fissile, Orange plate, Type "B" package.

Lassa virus

Lassa virus is grouped to the hemorrhagic fever viruses. It belongs to the Arenaviridae and induces a severe systemic illness with changes in vascular permeability, and severe cases are associated with bleeding. The case fatality rate is up to 15%. Also subclinical infections seem to be possible. Lassa fever is observed in human and non-human primates living in endemic areas in West Africa. The main reservoir are rodents (Mastomys natalensis). The main routes of infection are ingestion and inhalation of materials or food contaminated by infected mouse feces or urine.

Latency

It is the time delay between exposure and the first sign of symptoms. It is one of the defining factors for any toxic effect: toxicity, latency, persistency and transmissibility of the toxic substance.

In substances with short latency, the effects will be immediately recognisable; examples are fast-acting pulmonary agents (with high water solubility), 'tear gas', nerve agents or cyanides.

In substances with long latency, exposure may take place unknowingly, e.g. in the case of sulphur mustard exposure. After exposure to slow-acting pulmonary agents (with low water solubility) delayed lung oedema may occur.

See also: Toxicology, Toxicodynamics.

Latent infection

An infection that is inactive or dormant and is usually detectable only by serological methods.

See also: Persistent infection.

Lethal dose

The lethal dose is the amount or dose that is sufficient to kill a specific percentage of a population within a certain time. It is usually expressed as LD50 = 50% or LD100 = 100%.

Biological, chemical

The amount of a pathogen, toxin or chemical to cause death when taken into the body by a single absorption and according to the route of administration.

Radionuclear

The dose of radiation that causes death.

A more generic definition could be: Amount of a substance or physical agent (radiation) that causes death, according to the route of administration, when taken into the body by a single absorption (denoted by LD).

See: LD_{50}.

Lethality

describes the capability of something (infectious agents; chemical, biological or nuclear weapons) to cause death. The lethality (rate), also known as Case fatality rate, is given as number of cases of death in relation to the number of cases of a distinct disease (usually expressed in %).

Lewisite

Lewisite (L) is an example of organoarsenic compound. It was once manufactured as a chemical warfare agent (see CWC Annex on Chemicals, schedule 1.A.5) as a blister agent and lung irritant. Pure Lewisite is colourless and odourless. The technical grade of Lewisite contains impurities and is thus a yellow or brown liquid with a distinctive odour that has been described as similar to scented geraniums.

Symptoms and *toxicity*: are similar to those of sulfur mustard, the main difference being that pain is felt immediately after exposure. Lewisite is more volatile than mustard.

Treatment: standard measures: decontamination, life support. The antidote – British Anti-Lewisite (BAL, dimercaprol) – is used in medicine as arsene chelator.

LCt50: 1400 mg.min/m3; LD50 on skin: 30 mg/kg.

Limit of detection

The Limit of Detection (LOD) or Detection Limit (DL) is often defined as the minimum concentration of a substance, which can be observed in a sample with some degree of confidence. The confidence level is usually 99 %.

According to ICH guidelines, LOD refers to the lowest concentration of an analyte in a sample that can be detected, but not necessarily quantified, under the stated conditions of the test.

According to IUPAC, LOD is the smallest amount of concentration of analyte in the sample that can be reliably distinguished from zero.

Liquid chromatography

Liquid chromatography (LC) involves techniques where the mobile phase is always a liquid and the stationary phase is either a liquid or is embodied in a solid carrier.

Liquid chromatography is a technique used to separate a sample into its individual parts. This separation occurs based on the interactions of the sample with the mobile and stationary phases. Because there are many stationary/mobile phase combinations that can be employed when separating a mixture, there are several different types of chromatography that are classified based on the physical states of those phases. Liquid-solid column chromatography, the most popular chromatography technique , features a liquid mobile phase which slowly filters down through the solid stationary phase, bringing the separated components with it.

Lost

See: Sulphur mustard, vesicants.

Low dispersible radioactive material

Solid radioactive material that has limited dispersibility and is not present in powder form.

Low specific activity material

Or LSA. This refers either to radioactive material, which, by nature, has a limited concentration of radioactivity or to radioactive material for which limits of estimated average specific activity apply. External shielding materials surrounding the LSA material will not be considered in determining the estimated average specific activity.

Lung Damaging Agent

Chemical warfare agents, such as chlorine (CI2), phosgene (CG) or diphosgene (DP), which cause physical injury to airways and lungs. Lung-damaging agents are typically heavier than air and hang close to the ground when released. No antidote therapy is available, and medical treatment is only supportive. A large number of industrial chemicals has similar effects on the respiratory system.

Main charge

The main explosive charge is the final part of the explosive train. This charge provides the main effect of the explosion.

Marburg virus

See: Ebola virus.

Marine biotoxin

A toxin produced in the marine environment (sea water), generally by microalgae. According to WHO, Marine biotoxins are naturally occurring chemicals, caused by certain types of toxic algae that accumulate in fish and shellfish. When people consume such contaminated seafood, depending on the toxins, the symptoms can be diarrheic, paralytic, amnesic, and neurologic.

Examples include Saxitoxin, palytoxins (PITX), okadaic acid (OA), tetrodotoxin azaspiracid (AZA) group toxins, yessotoxin (YTX)-group toxins, pectenotoxin (PTX)-group toxins and domoic acid (DA). Human exposure is normally through eating contaminated seafood (mostly fish and shellfish).

Mass decontamination

The physical process of rapidly removing contaminants from a large number of people in the shortest possible time lapse, in potentially life-threatening situations to lower the risk of further harm and/or cross contamination.

Mass spectrometry

MS is an analytical method used to convert a molecule into gaseous ions, which are separated according to their mass-to-charge ratio. Recording the relative intensities of the individual ions is a tool for analysing whole material, providing information about their composition and quantitative aspects of the chemical structures.

A mass spectrum is a plot of the ion signal as a function of the mass-to-charge ratio. These spectra are used to determine the elemental or isotopic signature of a sample, the masses of particles and of molecules, and to elucidate the chemical identity or structure of molecules and other chemical compounds.

Master of vessel

Captain, commander or first officer of a ship or person in charge of a vessel or craft.

Maximum normal operating pressure

A reference value for the transportation of radioactive material. It is the maximum pressure above atmospheric pressure at sea level that would develop in the containment system over a period of one year under temperature and solar radiation conditions corresponding to the environmental conditions in the absence of venting, external cooling by an ancillary system, or operational controls during carriage.

Melioidosis

Infectious disease caused by a Gram-negative bacterium *Burkholderia pseudomallei.*

Humans and animals can be infected with *B. pseudomallei* through coming into contact with polluted surface water or soil. The bacteria generally enter the body through wounds, inhalation, or ingestion. Person-to-person or animal-to-human transmission is extremely rare.

It is predominately a disease of tropical climates, especially in Southeast Asia and northern Australia where it is widespread.

Melting point

The temperature at which a solid becomes a liquid at standard atmospheric pressure.

Metabolism

An umbrella term for all biological reactions in living organisms including absorption, transport, conversion and secretion of substances. The involved substances are referred to as metabolites.

Microorganism

Organisms so small that they can only be seen under a microscope. In most cases this is a single cell, but may also be a multi-cellular or a non-cellular entity, capable of replication or of transferring genetic material.

Examples can be found within groups of bacteria, archaea, viruses, protozoa, animals, fungi and microalgae.

According to OECD Best Practice Guidelines for BRCs – 2007, Micro-organisms" comprise all prokaryotes (archaea and bacteria), some eukaryotic organisms (fungi, yeasts, algae, protozoa), non-cellular entities (e.g. viruses), their replicable parts and other derived materials e.g. genomes, plasmids, cDNA.

Mixture

A mixture is a physical combination of two or more substances, in any form (gasous, liquid, solid), including a solution, suspension and colloids. Mixtures could be homogeneous or heterogeneous. A homogeneous mixture is a type of mixture in which the composition is uniform and every part has the same properties. A heterogeneous mixture is a type of mixture in which the components can be distinguished, as there are two or more phases present.

Mode of transport

This covers transport by road or rail in any vehicle; transportation by inland waterway in any vessel or hold, compartment or defined area of a ship's bridge; and transport by air in any aircraft.

Model, RN

For the transport of radioactive material, the model refers to the type of radioactive material (special form or not, low dispersible radioactive material or not) as well as the type of packaging. It allows the complete identification of the object. This description may include specifications, engineering drawings, reports demonstrating compliance with regulatory requirements, or other relevant documents.

Monitoring

Determining of the status of a system, a process or an activity.

Note 1: To determine the status there may be a need to check, supervise or critically observe.

[SOURCE: Annex SL of ISO/IEC Directives, Part 1: Consolidated ISO Supplement – Procedures specific to ISO]

Note 2: Monitoring in a flexible way changes that might occur in the near future and will require a response. It includes forward looking for symptoms of change, updating the situation picture as the situation evolves, and identifying emerging opportunities or threats that demand a crisis response from the organization.

Morbidity

The incidence of a disease/the number of ill persons due to a specific disease, scaled to the size of that population, in a given time period (typically expressed in ill persons due to a specific disease per individuals per year).

Note: Morbidity could also refer to the state of being ill within a population.

Mortality rate

The number of deaths (in general or due to a specific cause) in a population, scaled to the size of that population, in a given time period (typically expressed in deaths per individuals per year). In comparison, the term case fatality rate (CFR) describes the rate of deaths due to a specific disease or injury scaled to the size of persons who contracted that disease.

Multi-agency plan

A plan for the coordination and integration of the response to an emergency by a number of organisations.

Multilateral Export Control Regimes

Abbreviation MECR, are systems coordinating national policies in the field on export controls:

- Australia Group (1985) – common lists for dual use chemical manufacturing facilities, equipment, technology; dual use biological equipment, chemical weapon precursors and biological agents,
- Missile Technology Control Regime (1987) – controls on items contained in the Equipment, Software and Technology annex to the MTCR guidelines;
- Nuclear Suppliers Group (1975) – nuclear and nuclear-related exports;
- Wassenaar Arrangement (1995) – transfer of conventional armaments and dual use goods and technologies;

Documents of the MECR are not legally binding per se, nevertheless the lists of dual-use goods emitted by these fora are taken over by the Council Regulation (EC) N°428/2009 (2017 consolidated version) and thus, become legally binding at EU level.

Multilateral approval

This is the approval by the relevant competent authority of the country of origin of the design or shipment, as applicable, and by the competent authority of each country through or into which the consignment is to be carried.

Munitions

See: Ammunition.

Mustard

See : Sulphur mustard, Nitrogen mustard.

Mycosis

Mycosis a fungal infection of animals and humans, in or on a part of the body, or a disease caused by a fungus. Some fungi reproduce through very small air-borne spores which persons either inhale or pick up on their skin – i.e. most fungal infections start in the lungs or on the skin.

N.O.S.

Not Otherwise Specified. This collective term is applicable to substances, mixtures, solutions or articles that are not mentioned by name in the transportation regulations and which exhibit chemical, physical or dangerous properties corresponding to the class, classification code, packing group and the name and description of the n.o.s. entry.

NORM

naturally occurring radioactive material (NORM). Radioactive material containing no significant amounts of radionuclides other than naturally occurring radionuclides, suchus uranium, thorium, potassium and any of their decay products, such as radium and radon.

NPT

NPT – Treaty on the non proliferation of nuclear weapons – IAEA (1968) – is a treaty to limit the spread (proliferation) of nuclear weapons. Currently there are 191 States party to the treaty, five of which are recognized as nuclear weapon States: the United States, Russia, the United Kingdom, France, and China.

The treaty comprises rules on non-proliferation, disarmament, and the right to peacefully use nuclear technology.

Natural background radiation

This radiation is continuously present in the environment due to the presence of natural radiation sources, i.e. radium, uranium and thorium in rocks and building materials, cosmic rays, radon gas, etc.

Nerve agents

A group of chemical warfare agents. They are extremely neurotoxic organophosphorous compounds that were developed during or after World War II. Included in this group are: tabun (GA), sarin (GB), soman (GD), ethyl sarin (GE), cyclohexyl sarin (GF), and VX.

Nerve agents are viscous liquids under temperate conditions. As their odour– described as the smell of fruit or fish – may be faint or lost after storage, olfactory detection (by smelling) is not a reliable indicator.

Nerve agents inhibit acetylcholinesterase, leading to a massive over-stimulation of those parts of the nervous system in which acetylcholine is the transmitter substance.

The SLUDGE (Salivation, Lacrimation, Urination, Diaphoresis, Gastrointestinal motility, Emesis) syndrome is following by paralysis (including respiratory muscles one) leading to death results.

According to OPCW: nerve agents

Nerve agents block impulses between nerve cells or across synapses and are highly toxic with rapid effects. They act primarily by absorption through the skin and lungs. Nerve agents are divided into two main groups: G-series agents and V-series agents, named for their military designations. Some G-agents, particularly tabun and sarin, persist in the environment for only short periods. Other agents, such as soman and cyclosarin,

persist longer and present a greater threat to the skin. V-agents are extremely potent, with only milligrams needed to cause death, and persist for long periods of time in the environment.

Example agents

- Tabun (GA)
- Sarin (GB)
- Soman (GD)
- Cyclosarin (GF)
- VX

Dispersal

Liquid, aerosol, vapour and dust

Mode of Action

Absorption through lungs (G-series); contact with skin (VX)

Effects

Causes seizures, loss of body control; paralyses muscles, including heart and diaphragm.

Neurotoxin

Any toxin that interferes with or damages the nervous system.

Neutralisation

This is a chemical reaction between an acid and a base to form a salt.

Neutron

It is an elementary particle and part of the atom. It has no electrical charge.

Nitric acid

Chemical formula HNO_3, CAS number 7697-37-2

Pure nitric acid is a colourless, but commonly (especially high concentrated), due to decomposition it turn to yellow or brown. It is toxic, highly corrosive and oxidation mineral acid, fully miscible in water. It is used for production fertilizers, organic dyes, explosives, drugs and many other chemical substances.

Nitrogen Mustard

Nitrogen mustards (HN1, HN2, and HN3) were produced in the 1920s and 1930s as potential chemical warfare weapons. They are vesicants (or blister agents) similar to the sulfur mustards. Thus, they belong to the CWC Schedule 1A (06);

Nitrogen mustards come in different forms that can smell fishy, musty, soapy, or fruity. They can be in the form of an oily-textured liquid, a vapor (the gaseous form of a liquid), or a solid. Nitrogen mustards are liquids at normal room temperature (70ºF).

Nitrogen mustards can be clear, pale amber, or yellow-colored when in liquid or solid form.

The nitrogen mustards are also known by their military designations of HN-1 (originally was designed to remove warts but was later identified as a potential chemical warfare agent), HN-2 (designed as a military agent but was later used in cancer treatment. Other treatment agents now have replaced it), and HN-3 (designed solely as a military agent), but were never used in warfare.

Exposition:

- If nitrogen mustards are released into the air as a vapor, possible exposition through skin contact, eye contact, or breathing.
- If nitrogen mustards are released into water, possible exposition by drinking the contaminated water or getting it on your skin.
- possible exposition by coming in direct contact with liquid nitrogen mustards.
- Because it is heavier than air, nitrogen mustard vapor will settle in low-lying areas.

Immediate signs and symptoms:

Typically, signs and symptoms of nitrogen mustard exposure do not occur immediately. Depending on the severity of the exposure, symptoms may not occur for several hours.

Nitrogen mustards can have the following effects on specific parts of the body:

- Skin: redness usually develops within several hours after exposure followed by blistering within 6 to 12 hours.
- Eyes: irritation, pain, swelling, and tearing may occur. High concentrations can cause burns and blindness.
- Respiratory tract: nose and sinus pain, cough, sore throat, and shortness of breath may occur within hours. Fluid in the lungs is uncommon.
- Digestive tract: abdominal pain, diarrhea, nausea, and vomiting.
- Brain: tremors, incoordination, and seizures are possible following a large exposure.

Showing these signs or symptoms does not necessarily mean that a person has been exposed to a nitrogen mustard.

- These agents are similar to sulfur mustard in many ways, but they seem to cause more severe systemic effects, particularly in the central nervous system (CNS): they regularly caused convulsions when administered intravenously to animals.
- No antidote therapy is available and medical treatment is supportive only.

HN-1: LCt50: 1500 mg.min/m3; LD50 on skin: 20 mg/kg.

HN-2: LCt50: 3000 mg.min/m3; LD50 on skin: 10 mg/kg.

HN-3: LCt50: 1500 mg.min/m3; LD50 on skin: 10 mg/kg.

Nitromethane

Chemical formula CH_3NO_2, CAS number 75-52-5.

Nitromethane (NM) is a colourless liquid, slightly soluble in water. Nitromethane is used in chemical industries and is also used as a component of fuels for plane and rocket models as well as for dragster racing.

Non-compliance

Non-compliance is the failure to meet part of the quality system of a requirement or a deviation from the reference specifications.

Non-compliance may relate either to the product, the system, a process or a procedure.

Non-lethal weapons

Non-lethal weapons, also called less-lethal weapons, less-than-lethal weapons, or non-deadly weapons, are weapons intended to be less likely to kill a living target than conventional weapons. It is understood that accidental casualties are risked wherever force is applied, but non-lethal weapons try to minimise the risk as much as possible.

Non-sealed source

Or unsealed source, this refers to any radioactive source that does not correspond to the characteristics or requirements of a sealed source.

Nonel

See: Shock tube.

Normal exposure

This is expected to occur under the normal operating conditions of a facility or activity (including maintenance, inspection, decommissioning), including minor incidents that can be kept under control, i.e. during normal operation and anticipated operational events.

Nosocomial infection

Nosocomial infections are infections acquired in hospitals and other healthcare settings.

Nuclear attribution

The process of tracing the origin of nuclear or radioactive material used in illegal activities, to determine the point of origin and routes of transit involving such material, and ultimately to contribute to the prosecution of those responsible.

See: Nuclear forensics.

Nuclear forensics

The analysis of intercepted illicit nuclear or radioactive material and any associated material to provide evidence for nuclear attribution.

Nuclear fuel

Is the radioactive material used in nuclear power plants to deliver nuclear energy. The main nuclear fuels are uranium and plutonium.

Nuclear label I white

The I-WHITE label applies to the transportation of radioactive material beyond the limits of free packaging and the maximum radiation level on the external surface does not exceed 0.005 mSv/h.

Nuclear label II yellow

Label 7B category II-YELLOW. It applies to the transport of radioactive material, when the maximum radiation level on the external surface does not exceed 0.5 mSv/h, and in one meter distance from the external surface does not exceed 0,01 mSv/h.

Nuclear label III yellow

Label 7C in category III-YELLOW applies for the transportation of radioactive material when the maximum radiation level on the external surface is more than 0.5 mSv/h but does not exceed 2 mSv/h, and in one meter distance from the external surface does not exceed 0,1 mSv/h.

If the value is greater than 0.1 mSv/h it must be transported by exclusive use shipment.

Nuclear la**bel fissile**

This is to be used during the transportation of an overpack containing fissile radioactive material, other than excepted fissile material. These labels must be affixed adjacent to the radioactive material labels and must include the criticality safety index (CSI) as stated in the certificate of approval issued by the competent authority.

Nuclear material

Nuclear material refers to special fissionable material: Pu-239, U-enriched (in U-233 and/or U235) as well as to source material such as NU, DU and Th. This is differentiated further into "source material", consisting of natural and depleted uranium, and "special fissionable material", consisting of enriched uranium (uranium 235), uranium 233 and plutonium 239.

Note: IAEA statues defines nuclear material as [Article XX, IAEA Statues, amended 23 Feb. 1989, revised 2006, Vienna] "1) special fissionable material: Plutonium-239, Uranium enriched in Uranium-233 or Uranium-235 and 2) source material: natural uranium or depleted uranium or thorium."

See also: Radioactive material.

Nuclear medicine

Is a branch of medicine and medical imaging that uses radionuclides and relies on the process of radioactive decay in the diagnosis and treatment of disease (i.e. radiotherapy).

Typical radioactive isotopes used in nuclear medicine for imaging or radiotherapy are: fluorine-18 (18F), gallium- 67 (67Ga), indium-111 (111In), iodine-123 (123I), iodine-131(131I), krypton-81m (81mKr), rubidium-82 (82Rb), technetium-99m (99mTc), thallium-201(201Tl), xenon-133 (133Xe) and yttrium-90 (90Y).

Nuclear safeguards

The purpose of nuclear safeguards is to prevent diversion of nuclear material from peaceful uses to nuclear weapons or other nuclear explosive devices.

The safeguards system comprises an extensive set of technical measures to verify the correctness and the completeness of the declarations made by States about their nuclear material and activities.

See also: IAEA, NPT.

Nuclear security

Implementation of the Nuclear Security covers three areas:

- Prevention to protect nuclear and other radioactive material and facilities and transports from malicious acts.
- Detection of and response to malicious acts involving nuclear and other radioactive material
- Information coordination and analysis , which includes evaluation, cooperation with bilateral and multilateral support programs, and information collection to support prevention, detection and response.

Nuclide

Nuclide is an atom containing certain numbers of protons and neutrons. Most nuclides are radioactive, meaning they are unstable and undergo radioactive decay. They are referred to as radionuclides.

OPCW

The Organisation for the Prohibition of Chemical Weapons (OPCW) is an global, treaty-based international organisation with responsibilities for disarmament and non-proliferation, among others, located in The Hague, the Netherlands. Its mission is to implement the provisions of the Chemical Weapons Convention and to ensure a credible, transparent regime for verifying the destruction of chemical weapons (both by evaluating declarations by member states and on-site inspections); to prevent their re-emergence in any member state; to provide protection and assistance against chemical weapons; and to encourage international cooperation among State Parties in the peaceful use of chemistry. OPCW consists of three principal organs: the Conference of the States Parties, the Executive Council and the Technical Secretariat.

In 2013, in recognition of its extensive efforts to eliminate chemical weapons, the OPCW was awarded the Nobel Peace Prize, and in 2017, it commemorated its 20th anniversary.

Old chemical weapons

The Chemical Weapons Convention defines "old chemical weapons" as those produced before 1925, or those produced between 1925 and 1946, which have deteriorated to such an extent, that they can no longer be used as chemical weapons.

One health approach

The integrated approach emanates from the concept that human health is connected to animal and plant health. Its aim is to promote animal and human health by addressing risks emerging from this interface through cooperative national and global measures.

One Health is "the collaborative efforts of multiple disciplines working locally, nationally, and globally, to attain optimal health for people, animals and our environment", as defined by the One Health Initiative Task Force (OHITF).

Onset

Beginning of the impact of an emergency or disaster.

Optical spectroscopy

Optical spectroscopy using ultraviolet (UV) or visible light relies on the relationship between the concentration of a substance and the absorption of light going through that substance.

Orange Plate

Vehicles transporting dangerous goods must bear ADR orange plates (front and rear). When vehicles are carrying containers, the freight container must also be labelled or 'placarded' with the appropriate classification label on all four sides. The orange warning plate measures 400 mm x 300 mm with a 15 mm wide border. For the carriage of dangerous goods in tank vehicles and containers, ADR requires that both the vehicle and the tank are marked (e.g. 'numbered' orange plates at the front and rear of the vehicle, hazard placards and other marks, as required, on each side of the tank and at the rear). The numbered warning plate is divided horizontally by a black line: the upper part bears the hazard identification number and the lower part indicates the UN number.

Organic compounds

Chemical compounds contain significant amount of carbon. Former definition (rejected in the XIX age) related to compounds produced in the living organism only.

Organophosphorous compounds

This group of chemical substances contains the elements phosphorus, carbon and oxygen (also called organophosphorous compounds). Many insecticides and all nerve agents are organophosphorous compounds. Most of them are very toxic if inhaled, ingested or in contact with the skin. Toxicity is caused by the inhibition of acetylcholinesterase.

Treatment: standard measures: decontamination, life support (ventilation and airway management), symptomatic treatment. Antidote therapy: atropine and oximes (obidoxim, pralidoxime).

Orphan source

Refers to a radioactive source, the activity level of which, at the time of its discovery, is above the exemption level, and which is not under regulatory control, either because it has never been or because it has been abandoned, lost, misplaced, stolen or transferred, without proper notification of the competent authority, to a new holder or without informing the recipient.

Outbreak

In epidemiology, the terms outbreak and epidemic mean the same thing. However, the term outbreak is often used in connection with the occurrence of a disease caused by an agent (e.g. bacterium or virus) not previously recognized in that community or area, which exceeds the expected number of cases. An outbreak can affect a small, localized group or great numbers of people. In the context of a rare infectious disease two or a few linked cases can be sufficient to define an outbreak.

See also: Epidemic.

Outer cordon

or Outer Perimeter or Outer Safety Cordon / Perimeter. Designates the controlled area into which unauthorized access is not permitted. It encompasses the inner cordon, hot zones and warm zones.

Overpack

This is a type of casing, box or bag that is used by a single consignor to facilitate, by means of a single handling unit, the delivery of one or more packages, in order to improve the handling, stowage and transportation of radioactive material.

Oxidation

Oxidation can be defined as the loss of at least one electron by a molecule, atom or ion, when two or more substances interact. In common practice, oxidation is seen as the interaction between oxygen molecules and other substances, ranging from metals to living tissue.

Oxidizer

A substance that is not necessarily combustible, but may, generally by yielding oxygen, contribute to combustion or an explosion when reacting with a suitable fuel. Some typical oxidisers are oxygen, peroxides, nitrates, perchlorates and chlorates.

An oxidizer, also known as an oxidant or oxidizing agent, is a reactant that removes electrons from other reactants during a redox reaction.

See also: Fuel, Explosives and Oxygen balance.

Oxygen balance

The oxygen balance is the percentage excess or deficiency of oxygen required for complete oxidation of all the combustible ingredients (fuels) of an explosive (mostly carbon, hydrogen, aluminium) to produce ideal combustion products (CO_2, H_2O, N_2, Al_2O_3). Most civilian explosives are designed to zero oxygen balance to minimize the amounts of toxic gases (CO, NOx).

Passive decontamination

Decontamination effected by natural processes of decay, without benefit of human or mechanical intervention.

[SOURCE: CEN Standard EN 17173: 2020 'European CBRN Glossary']

PEL

Permissible Exposure Limit: see TLV-TWA, Exposure limits for chemicals.

PFIB

Perfluoroisobutylene (PFIB) is a toxic substance which is typically generated when synthetic materials (such as Teflon®) disintegrate in a fire at high temperatures (pyrolysis). For example, it is produced when military

vehicles catch fire. The resulting smoke contains PFIB, which can cause effects similar to phosgene – see that entry for symptoms and treatment.

PPE

See: Personnel Protective Equipment.

PPM conversion

The term ppm is often used for the concentration of air or liquid mixtures. It means parts per million by volume or by mole; ppms are identical for an ideal gas and almost identical for most gases at 1 atm. One part per million (by volume) is equal to the volume of a given gas mixed in a million volumes of air, therefore a microliter volume of gas in one liter of air is equal to 1 ppm: 1 ppm = 0.0001 %; 100 ppm = 0.01 %.

The other frequently used expression for concentration is mg/m3. Conversion between these two values is possible by using the following equation: mg/m3 = ppm x molwt / 24.04

Where: molwt is the molecular weight [g/mol], conditions: 20°C, atmospheric pressure 1013, 25 hPa.

Package, RN

Package is the packaging with its radioactive contents as presented for transport. The characteristics of both the package and packaging, in terms of preserving integrity of the containment and shielding, depend on the

quantity and nature of the radioactive material being transported. The operational standards applied are graded according to the conditions for transportation which are categorised in the following degrees of severity:

- Routine conditions of carriage (incident free)
- Normal conditions of carriage (minor mishaps)
- Accident conditions of carriage.

Note: This covers all the components necessary to enclose the entire contents (radioactive). It may comprise, in particular, one or more receptacles, absorbent materials, spacers, radiation shielding, service equipment for filling, emptying, ventilating and releasing pressure, and devices for cooling, absorbing shocks, facilitating handling and enabling tie-down, and for thermal insulation, and auxiliary devices which are part of the package. The packaging may be a container or tank.

Packaging

Potentially hazardous biological materials must be packaged to withstand leakage of contents, shocks, temperature, pressure changes and other conditions that can occur during ordinary handling in transportation. Biological materials must be packaged according to the triple packaging principle. The three elements of triple packaging include: primary receptacle, leak-proof secondary container, and durable outer container. Infectious substances in Category A and B, patient specimens and genetically modified microorganisms must be packaged in this way, with slight variations.

Note: Packaging and shipping biological materials involves certain risks with numerous potential liabilities. A shipment of biological material will fall into one of the five following categories: Unregulated biological material, Category A Infectious Substances, Category B Infectious Substance, Patient specimens, Genetically Modified Organisms (GMOs).

Packing group

For the purposes of packing, dangerous goods are assigned to a certain packing group according to the degree of danger they represent for transportation:

- Packing group I: substances presenting high danger
- Packing group II: substances presenting medium danger
- Packing group III: substances presenting low danger

Particle detection

See: Trace detection.

Pathogen

See: Pathogenic agent.

Pathogenic agent

Pathogenic agents are organisms or infectious particles or toxins with the ability to cause disease. This ability to cause disease is called pathogenicity.

Percutaneous

This defines a substance's route of entry into the body – i.e. 'through the skin'.

See also: Routes of exposure.

Perimeter

The border or outer boundary of a defined area.

See: Inner cordon, outer cordon.

Persistency

The continued or prolonged existence of a substance. With reference to chemicals, it is the ability over time to remain in an active state within the environment (and, in case of CWA, to still pose a threat). Persistency is a defining factor for any toxic effect: toxicity, latency, persistency and transmissibility of the toxic substance. It is inversely related to volatility: the more volatile a substance is, the quicker it evaporates and the less it tends to persist as a liquid and to contaminate terrain and material. Chemical degradation (e.g. by sunlight) is another factor which reduces contamination.

See also: Toxicology, Toxicodynamics.

Persistent infection

A long-lasting infection or life-long latent infection with asymptomatic periods and recurring acute episodes of clinical disease (e.g. caused by herpesviruses like Herpes simplex virus) or onset of severe clinical disease after a long asymptomatic phase (e.g. caused by lentiviruses like HIV).

Person borne improvised explosive device

(PBIED) An improvised explosive device carried on a person with the intention of attacking people or property by detonating the device while on the person.

Note: This is commonly referred to as a 'suicide bomber', or "homicide bomber", "genocide bombing" or "sacrifice bombing" (less frequent).

See also: IED, VBIED.

Person likely to be infected

Also called "susceptible", a healthy person who is suspected to have incorporated an infectious disease agent either by direct contact with a sick person, a suspect of illness or a carrier of the agent or by direct contact with body fluids/contaminated objects of those persons.

In the case of a deliberate release of an infectious agent, those persons who are suspected or have been exposed to communicable infectious disease agents.

Person likely to be sick

A person who has developed symptoms of a disease those are in agreement with those corresponding to a specific infectious agent.

Personal Protection Equipment

Personal protective equipment (PPE) is equipment worn to prevent or minimize exposure to serious injuries and illnesses. These injuries and illnesses may result from contact with chemical, biological, radiological, physical, electrical, mechanical, explosive or other hazards. Personal protective equipment may include items such as lab coats, gowns, full-body suits, fire retardant or chemical-proof clothing, protective footwear, gloves, safety glasses, safety goggles and shoes, earplugs, hard hats, masks and respirators, or coveralls, vests and full body suits, according to specific countries existing regulation.

Phosgene

Phosgene (Formula: $COCl_2$) is extremely toxic chemical compound as a choking agent (used as a chemical weapon during World War I where it was responsible for 85,000 deaths), smells like newly cut grass, newly mown hay, or green corn. The toxic concentration of this colourless, highly toxic, non-flammable gas is lower than the perceptual threshold for smelling it. Phosgene is a very dangerous respiratory poison. It has low water solubility and acts mainly on the peripheral airway (lung tissue), resulting in delayed lung oedema (see pulmonary agents). Used in industry for organic synthesis.

It is listed on the CWC Schedule 3, A1.

Treatment: standard measures: decontamination, life support. No antidote therapy is available and medical treatment is supportive only. After suspected inhalation of phosgene, physical activity must be strictly limited (bed rest) and in time the patient should be transferred to a medical facility with an intensive care unit.

LCt50: 3000 mg.min/m3; LD50 on skin: 800 mg/kg.

Phosphoryl chloride

Synonym: phosphorus oxychloride, Formula: $POCl_3$. CAS No 10025-87-3.

The most important use of this colourless liquid is making phosphate esters. The substance is listed as precursor on Schedule 3 (B5) of the Chemicals Weapon Convention.

Physical protection

Physical protection in the context of security of explosives is security measures that are designed to mitigate the effects of a threat that could not be prevented, e.g. an IED that detonates outside an important building.

Physical protection can e.g. be protective barriers, body armour, reinforced concrete walls, etc.

Picric acid

Synonyms: trinitrophenol, chemical formula $C_6H_2OH(NO_2)_3$, CAS number 88-89-1.

The substance consists of yellow or light brown crystals. Soluble in water, with some metals create very sensitive explosives. It was used as a military explosive during WWI.

Pipe bomb

An improvised explosive device (IED), a sealed section of pipe filled with an explosive material. The containment provided by the pipe causes a relatively large explosion, and the fragmentation creates potentially lethal fragments.

Plague

Plague is a zoonotic disease caused by Yersinia pestis, which belongs to the family of Enterobacteriaceae. Three main manifestations are observed: bubonic, septicaemic and pneumonic plague. Bubonic plague is an infection of the lymphatic system, pneumonic plague an infection of the respiratory system, and septicaemic plague an infection in the blood stream. Typically, antibiotics include a combination of gentamicin and a fluoroquinolone.

Planning assumptions

Descriptions of the types and scales of consequences for which organisations should be prepared to respond.

Plutonium

The chemical element plutonium (Pu) is a radioactive element with the atomic number 94, produced when uranium is irradiated in a nuclear reactor. It is used primarily in nuclear weapons and, along with uranium, in mixed-oxide (MOX) fuel for reactors.

Plutonium 239 (^{239}Pu) is the most suitable isotope for use in nuclear weapons. It has a half-life of 24.110 years.

Poison control center

A poison control center (also referred to as an intoxication emergency call number or poison information hotline) is a medical facility, which can provide immediate, free and expert treatment advice and assistance over the telephone in case of exposure to poisonous or hazardous substances.

Personnel answer questions about potential poisons as well as providing treatment management advice. Poisons covered may include all or some of the following: household products, medicines, chemicals, pesticides, plants, bites and stings, food poisoning and fumes.

Polonium

The chemical element polonium (Po), atomic number 84, is a silver-gray semi-metal. This highly radioactive element occurs in uranium ores.

Polonium 210 (210Po) is highly radiotoxic and the mostly available isotope. It is an alpha emitter that has a half-life of 138 days.

Post mortem data

Information about a dead person.

See also: Casualties.

Potassium chlorate

Chemical formula $KClO_3$, CAS number 3811-04-9.

The substance is an inorganic oxidizer. It forms white or colourless crystals soluble in water. Mixed or contaminated by some materials could be dangerous to handle and operate (could explode or flammable).

Potassium nitrate

Chemical formula KNO_3, CAS number 7757-79-1

Potassium nitrate is an inorganic oxidizer. It forms white or colourless crystals soluble in water. It is used as a fertilizer (labelled with NPK number 13-0-44) or in meat processing.

Potassium perchlorate

Chemical formula $KClO_4$, CAS number 7778-74-7.

Potassium perchlorate is an inorganic oxidizer. It is a white or colourless crystalline compound slightly soluble in water.

Potential exposure

This type of exposure is not a certainty, but may result from an event or sequence of events, which are probabilistic in nature, including equipment failure and operational errors.

Precautionary statements

Precautionary statements are part of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). They provide a set of standardised phrases giving advice about the correct handling of chemical substances and mixtures, which can be translated into different languages. As such, they serve the same purpose as the safety phrases (S-phrases), which they are intended to replace.

Precursor

A precursor is a chemical reactant, which takes part in the production of another chemical. In safety and security context frequently referred to illegal drugs precursors, explosive precursors or chemical weapon precursors.

See: Explosives precursor, Chemical weapons precursor.

Preparedness

Process of preparing to deal with known risks and unforeseen events or situations that have the potential to result in an emergency.

Preparedness phase

On-going phase focused on preparedness for emergencies and disasters.

Preponderance of the danger

When a substance exhibits different dangers, the predominant danger is defined as the one that is more important than the other dangers, which exist for the same subject.

Prevention RN

In the RN field, prevention includes measures to protect nuclear and other radioactive materials against theft or other form of loss of control, illegal possession, smuggling, and unauthorized use, as well as measures to protect nuclear installations and transport against sabotage and other malicious acts that can result in radiation exposure to the general public or the environment.

The term "prevention" is also used to describe the first line of protection against nuclear terrorism.

Primary explosives

are substances or mixtures that can easily be detonated by a non-explosive simple initiating impulse such as a flame, impact, friction, heat, electricity or spark etc. They are mainly used in applications where it is desired to produce a shock wave for initiation of a less sensitive secondary explosive or a flame for initiation of propellants. Most of the primary explosives are highly sensitive to mechanical stimuli that make handling them very dangerous.

See: Detonation, Sensitivity of explosives.

Primer

Primer is a primary initiating device to produce a hot flame and hot combustion products. Primers are used to ignite propellant (powder) in the cartridges in firearms.

Propellant

is an energetic material whose combustion is applied for acceleration and movement of e.g. a projectile or rocket. High velocity combustion products provide the energy for acceleration or movement.

Propelling charge

Projectile ammunition is ejected from its weapon by means of a propelling or expelling charge. A propellant provides continued propulsion to the projectile after it has left the barrel.

Proportional counter

is a type of gaseous ionization detector device used to measure particles of ionizing radiation. Effective for the measurement of gamma radiation, X-Rays, and alpha and beta particles.

Public awareness

A level of knowledge within the community about risks and preparedness for emergencies, including actions the public authorities will take and actions the public should take.

Pyrotechnic mixture

See: Pyrotechnics.

Pyrotechnic substance

See: Pyrotechnics.

Pyrotechnics

Compounds which are able to produce a desired light, sound, heat, release of gas or smoke effect.

See also: Energetic material.

Q fever

Q fever is induced by an infection with *Coxiella burnetii*, an obligatory intracellular bacterium that affects humans and animals. Infections in *animals* are observed in cattle, sheep, goats and other domestic mammals. A relevant route of infection is inhalation of a spore-like small cell variant, but infections through milk and by contact with urine, feces, vaginal mucus or semen of infected animals have been reported. Rarely, the disease is tick-borne. *Humans* can be infected with a low dose (few organisms), and the incubation period varies between 9 and 40 days. Commonly used antibiotics include doxycycline, tetracycline, chloramphenicol, ciprofloxacin, ofloxacin, and hydroxychloroquine. Chronic Q fever is more difficult to treat and can require up to four years of treatment with doxycycline and quinolones or doxycycline with hydroxychloroquine.

See also: *Coxiella burnetii*.

Quality assurance

All the planned and systematic actions necessary to provide adequate assurance that a structure, system, component or procedure will perform satisfactorily in compliance with agreed standards. Quality control is a part of it.

Quality control

A set of operations (programming, coordinating, implementing) intended to maintain or improve quality. It includes monitoring, evaluation and maintenance at required levels of all equipment performance characteristics that can be defined, measured and controlled.

Quarantine

Separation or restriction of free movement of a healthy person (animal or plant) who may have been exposed to a communicable disease to see if the person becomes ill. Usually the duration of quarantine is restricted to one incubation period for suspects of infection imposed to prevent the spread of contagious diseases to others.

Alternatively, the isolation of a person who does not have a disease during a disease outbreak in order to prevent that person from catching the disease.

Quartering

This method of sampling reduces the bulk of a sample (e.g. ores or soil) to obtain a small sample of average composition for analysis.

Coning and quartering is a method used by analytical chemists to reduce the sample size of a powder without creating a systematic bias. The technique involves pouring the sample so that it takes on a conical shape, and then flattening it out into a cake. The cake is then divided into quarters; the two quarters which sit opposite one another are discarded, while the other two are combined and constitute the reduced sample. The same process is continued until an appropriate sample size remains. Analyses are made with respect to the sample left behind.

R-phrases

R-phrases (short for risk phrases) are defined as special risks attributed to dangerous substances and preparations. The system, which is based on the Dangerous Substances Directive, will continue to be used in parallel with GHS and CLP until 2016. The R-phrases will then be replaced by Hazard statements.

RDD

See: Radiological dispersion device.

REACH

REACH is the main EU Regulation on dangerous industrial chemicals. It sets standards for the registration, evaluation, authorisation and restriction of all already-existing chemicals (phase-in) as well as for new chemical substances (non-phase-in). In addition, it regulates the storage of Information about the properties of substances in a database (REACH-IT), which is operated by the European Chemical Agency (ECHA).

Under REACH, companies are responsible for identifying and managing the risks associated with the substances they manufacture and market in the EU. They have to demonstrate to ECHA how the substance can be used safely and register this information with ECHA where it is made freely available on the Agency's website. Companies must also communicate risk-management measures to users; the main instrument for this information is the safety data sheet.

RED

In the CBRN context, RED is acronym for radiological exposure device.

See: Radiological exposure device.

REL

A recommended exposure limit (REL) is a chemical exposure limit for worker protection in occupational settings.

REL refers to the highest allowable airborne concentration that is not expected to injure a worker; it is expressed as a ceiling limit or time-weighted average (see TLV-TWA) for an 8- or 10-hour working day.

See also: Exposure limits for chemicals.

RID

The Regulation concerning the International Carriage of dangerous goods by rail across mainland Europe.

RN

Abbreviation for radioactive and nuclear. For clarification, some entries in this glossary are labelled RN.

RN dose

This general term indicates a measure used to assess radiation hazards resulting from ionising radiation.

RN exemption level

These are radioactivity levels, established by a regulatory body and expressed in activity concentration, total activity, or dose rate, below which a source of radiation may be granted exemption from regulatory control, i.e. exempted from notification, registration or licensing.

Radiation

Radiation is a form of energy emitted during radioactive decay. There are two basic types of radiation: ionising and non-ionising, depending on their energy. Ionising radiation – IR, with energy above 5 eV (electron volt), such as alpha particles and X-rays – can ionise atoms, which means it can remove electrons from atomic shells. Non-ionising radiation – NIR, with energy below 3 eV, like, for example, ultraviolet (UV) light and visible light – cannot ionise atoms.

Radiation level

In radioactive material transport regulation, the dose rate expressed in millisieverts per hour (mSv/h).

Radiation protection programme

This systematic set of rules aims to provide adequate control measures for radiation protection. The Radiation Protection Programme is required by the regulations for transporting radioactive materials by road, railway, inland waterway (Chapter 1.7.2) and sea (Chapter 1.5.2).

Radioactive contents

This term refers to radioactive material together with any contaminated or activated solids, liquids or gases within the packaging.

Radioactive explosive device

Combination device of explosives and radioactive material that causes dissemination of radioactive material without a nuclear detonation.

Source: CEN EN 17173 'European CBRN Glossary'

See: Dirty bomb.

Radioactive improvised explosive device

(RIED) is a homemade explosive device to scatter radioactive material.

See: Dirty bomb.

Radioactive material

Any material, which releases a spontaneous emission of particles (alpha, beta, neutron) or radiation (gamma, K capture), or both at the same time, from the decay of certain nuclides that these particles are, due to an adjustment of their internal structure.

Radioactive source

A radioactive source can be of natural or artificial origin (manufactured source). A manufactured source of radiation is typically used for industrial, research, or medical applications, i.e. iodine-131(131I) for radioisotope therapy of thyroid cancer, caesium-137 (137Cs) or cobalt-60 (60Co) for industrial radiography in non destructive testing and inspecting materials for hidden flaws.

See also: Nuclear medicine.

Radioactive waste

Refers to radioactive material in solid, liquid or gas form for which no further use is foreseen. These substances, which can no longer be used as such in the production cycle, are subsequently transported for reprocessing or disposal.

Radioactivity

The spontaneous emission of energy in the form of radiation, generally alpha or beta particles, is often accompanied by gamma rays from the nucleus of an unstable isotope.

Radioisotope

Radioactive form of an element, which may be used for therapeutic and diagnostic purposes.

Note: The term is mainly used in nuclear medicine.

See: Radionuclide.

Radiological dispersion device

Radiological Dispersion Device (RDD) is any device that causes the purposeful dissemination of radioactive material without a nuclear detonation.

The radioactivity in RDD can be dispersed with explosive method (dirty bomb) or none-explosively, such as through spraying or spreading by hand.

See: Dirty bomb.

Radiological exposure device

Abbreviation RED, a type of radiological dispersal device, using partially or fully unshielded radioactive material intended to expose people to significant doses of ionizing radiation without their knowledge (for instance sealed radioactive material hidden in a public place). This type of device does not cause radioactive contamination.

Radionuclide

An unstable isotope of an element that decays or disintegrates spontaneously, thereby emitting radiation. More than 3000 natural and artificial radioisotopes – or radioactive isotopes (radionuclides) – have been identified.

Radiopharmaceutical

Medicine that contains one or more radionuclides that are incorporated for therapeutic and diagnostic use is known as radiopharmaceutical. It often has a very short half-life.

Radiotoxicity

Radiotoxicity (as opposed to chemical toxicity) of a substance refers to its potential capacity to cause damage to living tissue due to its radioactive emissions.

See also: Effective dose coefficient.

Raman spectroscopy

A laser based, spectroscopy method for contact-free material characterization. The method provides a spectral fingerprint that uniquely identifies the substance or substances in a sample. Hand held apparatus for measurement are available.

Ready-time

The ready-time for a detector is the time it takes from cold start to be ready for detection. The ready-time of a detector is less crucial as a performance indicator than e.g. analysis time since it is typically only done once per working shift.

Recognised installation, RN

This is either a facility located in the territory of a Member State, and authorised by the competent authorities of that State in accordance with national law for the long-term storage or disposal of sources, or is an installation duly authorised under national law for the interim storage of sources.

Recovery

Restoration and improvement, where appropriate, of operations, facilities, livelihoods or living conditions of affected organizations, including efforts to reduce risk factors.

[SOURCE: ISO 22300:2018 'Security and resilience — Vocabulary']

Recovery phase

Phase focused on recovery, commencing at the earliest opportunity following the onset of an emergency, and running in tandem with the response phase.

Regulation (EC) No 1907/2006

Regulation of the European Parliament and the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

See: REACH.

Relative vapour density

RVD is defined as the mass of a gas or vapour compared to air, which has an arbitrary value of 1. If the RVD value of a gas is less than 1, then the gas is lighter than air and hence will rise – the lighter the gas the faster it rises. If the RVD value is greater than 1 then the gas is heavier than air and will sink.

To calculate the RVD of a gas:

RVD = Relative molecular mass of gas / Relative molecular mass of air

Remote detection

Process of detection with the operator being at a safe distance from the hazard.

[Source: CEN EN 17173:2020 'European CBRN Glossary']

Rendez-vous point

Point to which all resources arriving at the outer cordon/perimeter are directed for logging, briefing, equipment issue and deployment.

Rescue

Is the assisted removal of people unable to remove themselves from an area of greatest danger to a place of relative or complete safety.

Reservoir

Any host or carrier that harbours pathogenic organisms, without injury to itself and serves as a source from which other susceptible hosts can be infected. The infectious agent primarily depends on the reservoir for its survival.

Resolution 1540

Resolution 1540 (2004) – United Nations Security Council – Non-proliferation of weapons of mass destruction where it is decided that all States shall refrain from supporting by any means non-State actors that attempt to develop, acquire, manufacture, possess, transport, transfer or use nuclear, chemical or biological weapons and their delivery systems.

See: Weapons of mass destruction.

Responder Decontamination

Planned and organized removal or reduction of hazardous materials from responders when they withdraw from their activities in the hot or warm zone at a CBRN incident.

Response

Actions taken during or immediately before or after a disaster to manage its consequences and minimize suffering and loss.

Response phase

Phase in which decision making and actions are focused on response to an actual emergency or disaster.

Restricted explosives precursor

A restricted explosives precursor is a substance listed in Annex I to Regulation (EU) No 98/2013 on the marketing and use of explosives precursors. The substances are not to be available to the general public in concentrations higher than the limit value set out in the Regulation (see below).

The restricted explosives precursors (limit) are:

- Hydrogen peroxide (12 % w/w)
- Nitromethane (30 % w/w)
- Nitric acid (3 % w/w)
- Potassium chlorate (40 % w/w)
- Potassium perchlorate (40 % w/w)
- Sodium chlorate (40 % w/w)
- Sodium perchlorate (40 % w/w)

Ricin

Ricin is a potent proteinaceous Toxin (one of the most poisonous naturally occurring toxins) found in the seeds of the castor bean plant Ricinus communis known as castor oil plant. Ricin is a controlled chemical under Schedule 1A of the Chemical Weapons Convention (CWC), and is a Category B substance under the Biological and Toxins Weapons Convention (BTWC). It acts as a poison similar to abrin. Ricin has attracted interest as a

military chemical/biological warfare agent and as a poison for criminal and terrorist use. Main administration routes can be oral (whole castor beans with damaged husks or purified toxin in food or water), but inhalation and injection are the two most effective ways to infect humans. Nevertheless, depending of the related dose, the ingestion cloud be fatal.

Skin or eye exposure can lead to irritation but the toxin is unlikely to be absorbed. No transmission between humans. There is no commercially available antidote.

Risk

Effect of uncertainty on objectives.

Note 1: An effect is a deviation from the expected. It can be positive, negative or both, and can address, create or result in opportunities and threats.

Note 2: Objectives can have different aspects and categories, and can be applied at different levels.

Note 3: Risk is usually expressed in terms of risk sources, potential events, their consequences and their likelihood.

[SOURCE: ISO 31000:2018 'Risk Management']

Risk assessment

- Overall process of hazard identification (identification of a risk source capable of causing adverse effects to humans or the environment);
- hazard characterization (quantitative evaluation of the nature of the adverse health effects associated with the hazard);
- exposure assessment (evaluation of the likely exposure of man and/or the environment to risk sources); and
- risk characterisation (estimation, including attendant uncertainties, of the probability of occurrence and severity of known or potential adverse health effects in a given population).

Risk control

Measures to reduce the likelihood of an emergency occurring from a given risk, and/or implement measures to mitigate the impacts of that emergency should arise.

Risk management

All activities and structures directed towards the effective assessment and management of risks and their potential adverse impacts.

Risk priority

The relative importance of the treatment(s) required for the management of the risk, based on the risk rating and the additional capabilities required to manage risk.

Rotterdam Convention

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade is a multilateral treaty to promote shared responsibilities in relation to the

importation of hazardous chemicals. The Convention promotes an open exchange of information and calls on exporters of hazardous chemicals to use proper labelling, include directions on safe handling, and to inform purchasers of any known restrictions or bans. Signatory nations can decide whether to allow or ban the importation of chemicals listed in the treaty, and exporting countries are obliged to ensure the compliance of producers within their jurisdiction. National authorities must be appointed for information exchange.

The Convention covers pesticides and industrial chemicals that have been banned or restricted for health or environmental reasons. These are listed in the Convention's annexes. It does not cover radioactive materials, wastes and chemical weapons.

Routes of exposure

A route of exposure or pathway is the way on which a CBRN substance enters the body. Any harmful substance can enter an organism by:

1. *Inhalation* via the respiratory system (breathing in);
2. *Ingestion* via the gastrointestinal system (swallowing);
3. *Transdermal* and through the skin (percutaneous absorption) andtransmucosal absorption through mucous membranes (the surface of all body passages in contact with the air, including those of the eye);
4. Entry through *wounds* or otherwise damaged skin;
5. *Injection* subcutaneously, intramuscularly, intravenously, etc.

S-phrases

Phrases (short for safety phrases) give safety advice on handling dangerous substances and preparations. They are defined in Annex IV of European Union Directive 67/548/EEC.

SALW ammunition

Acronym for small arms and light weapons range from clubs, knives and machetes to, for example, mortars below the calibre of 100 mm. They are manufactured to military specifications for use as lethal instruments of war. Broadly speaking, small arms are those weapons designed for personal use, and light weapons are those designed for use by several persons serving as a crew. Based on this broad definition, the weapons are categorized as follows:

Small arms:

- revolvers and self-loading pistols,
- rifles and carbines,
- sub-machine-guns,
- assault rifles,
- light machine-guns.

Light weapons:

- heavy machine-guns,
- hand-held under-barrel and mounted grenade launchers,
- portable anti-aircraft guns,
- portable anti-tank guns, recoilless rifles,

- portable launchers of anti-tank missile and rocket systems,
- portable launchers of anti-aircraft missile systems,
- mortars of calibres of less than 100 mm,
- ammunition and explosives,
- cartridges (rounds) for small arms,
- shells and missiles for light weapons,
- mobile containers with missiles or shells for single-action anti-aircraft and anti-tank systems,
- anti-personnel and anti-tank hand grenades,
- landmines,
- explosives.

Source: Council Decision 2011/428/CFSP.

SCBA

See: Self-contained breathing apparatus.

SPEGL

A Short-term Public Emergency Guidance Level (SPEGL) is an acceptable concentration for unpredicted, single, short-term exposure of the general public in emergency situations. SPEGLs may be given for different exposure periods (e.g. 1, 2, 4, 8, 16, 24 hours). This concept was developed by the US National Research Council. However, only a few SPEGLs have ever been developed and published, and the levels have now been replaced by AEGL and ERPG.

See also: Exposure limits for chemicals.

STEL

See: TLV-STEL, Exposure limits for chemicals.

Safe distance, explosives

The safe distance from an explosive event is outside the explosive danger area.

Safeguards

See: Nuclear safeguards.

Safety

It is protection against the hazards (not threats) e.g. workers against accidental events. Not be confused with security.

See: Biosafety, International chemical safety cards, Safety data sheet, Tremcards.

Safety data sheet

A material safety data sheet (MSDS), safety data sheet (SDS), or product safety data sheet (PSDS) include information such as physical data (melting point, boiling point, flash point, etc.), toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment and spill-handling procedures. It is intended to provide workers and emergency personnel with procedures for handling or working with that substance in a safe manner.

SDS rules are set out in GHS and REACH.

Safety perimeter, explosives

Whenever an explosive device is encountered a safety perimeter must be established, inside, which only qualified personnel, is allowed. The safety perimeter must be determined in relation to the safe distance from the explosive device as well as any aspects arising from the surrounding geography, e.g. buildings and a current risk assessment.

If it is a CBRN IED, the security perimeter must take into account not only the risk of explosion, but also the CBRN risk.

Sample handling

The handling of samples includes storage, transport, handing over and disposal of samples during their taking and packaging or before storage. Samples should not be left unsupervised and must be locked away for safe keeping. Only authorised personnel can be entrusted with the handling and processing of samples. Full traceability (of the samples --materials and records--, of the personnel that is authorized to have access to the samples,...) shall be ensured as well as the complete integrity preservation of the samples: it is the "chain of custody".

Sampling

The act or process of selecting and taking a small part or quantity of something as a sample for testing or analysis. This procedure usually involves two steps: taking the sample and sample handling. The sampling shall be done in such a way as to be representative of the overall initial contamination.

Sampling techniques

Remnants of suspicious materials should be transferred to unbreakable, leak-proof containers and packed separately from one another, including the original container itself. Gases or vapours can be sampled with a gas-tight syringe. When sampling a material that is difficult to remove, such as concrete, an absorbent may be wiped or sprinkled on to the surface to absorb traces of suspicious agents.

Subsequently, the recommended number of samples depends on the purpose of the sampling as well as on analytical technique used and the situation at the scene. In general, the smallest quantity of samples are: soil samples 250 g, aqueous samples 250 ml, paint, rubber, wood and other solids – surface 5 x 5 cm. In the chemical field, OPCW has developed recommended operating procedure for doing so, see “Recommended operating procedures for analysis in the verification of chemical disarmament”. P. Vanninen (ed); University of Helsinki, Finland, 2017. For further information, see: http://www.helsinki.fi/verifin/bluebook/.

Sarin

An extremely toxic and corrosive neurotoxic organophosphorous agent , chemical warfare agent classified as a CWC Schedule 1 compound (see nerve agent for symptoms and treatment). In pure form, it is a clear, colourless and tasteless liquid without an odour. Sarin is liquid under NTP (Normal Temperature and Pressure),

but can evaporate easily and spread into the environment (bp around 158°C, but high vapour pressure and volatility). Nevertheless, the cyclohexyl sarin is more persistent in the environment. The substance was used in an attack on the Tokyo subwayin 1995.

LCt50: 35 mg.min/m3; LD50 on skin: 24,28 mg/kg.

Saxitoxin-group

A group of closely related toxins produced by several marine dinoflagellates (usually Alexandrium sp.). The term saxitoxin includes a number of related neurotoxins, which can accumulate in filter feeding bivalve molluscs (shellfish) such as oysters, mussels and clams. Saxitoxin-group toxins cause paralytic shellfish poisoning (PSP) in humans through consumption of contaminated shellfish. Symptoms vary from a sought tingling sensation or numbness around the lips to fatal respiratory paralysis.

Saxitoxin is listed in schedule 1 of the Chemical Weapons Convention (CWC).

Scene

Point or area of the immediate impact of an incident or emergency.

Screening of liquids, gels or aerosols

See: Screening for explosives

Sealed source

This source consists of radioactive materials, which are securely incorporated in solids and are thus inactive, or are sealed in an inactive container of sufficient strength to prevent, under normal conditions of use, the dispersion of radioactive materials exceeding the values set by the applicable codes of practice.

Search and rescue

Use of specialised personnel and equipment to locate people in distress or in danger and remove them from a place of actual or potential danger to a place of relative safety.

Secondary device

A secondary device is an IED that is placed and intended to be detonated after the primary IED has been detonated and rescue personnel is in place. The specific target of a secondary device is the rescue personnel.

Secondary explosive

Secondary explosives are individual explosive compound or formulations that are relatively insensitive to non-explosive stimuli. Secondary explosives are initiated by a detonator. Secondary explosives are used for blasting and to obtain fragmenting and accelerating effects in many industrial and military applications. Typical secondary explosives are formulations of TNT, RDX, plastic explosives like C4, etc.

See also: Sensitivity of explosives, Fragment.

Secular equilibrium

Secular radioactive equilibrium is a situation in which the quantity of an intermediate radioactive isotope remains constant because its production rate (e.g. due to decay of a parent isotope) is equal to its decay rate.

Security

Protection against intentional damages (threats). Not be confused with safety.

See: Biosecurity, Nuclear security, Security of explosives, Security scanners.

Security of explosives

Security of explosives or Explosives Security refers to the prevention of use contrary to law and order.

Security scanner

A security scanner (SSc) is a device that detects objects on a person's body for security screening purposes, without physically removing clothes or making physical contact. It is based on anomaly detection, i.e. methods to find objects that are not supposed to be present.

Selectivity of detection equipment

The selectivity of a detection instrument is a measure (the probability) of how well it can differentiate harmful CBRN agent from other substances (i.e. interfering substances, including innocuous materials).

According to IUPAC, selectivity refers to the extent to which a method can determine particular analytes (i.e. the substance of interest: harmful CBRN agent)in mixtures or matrices without interferences from other components. In other words, Selectivity refers to the ability of the method to discriminate a particular analyte in a complex mixture without interference from other components.

The result of a measurement may be either of the following (see also: Confusion matrix):

- True positive = correctly identified as a threat
- False positive = incorrectly identified as a threat. A false positive result contributes to the false alarm rate of an instrument.
- True negative = correctly rejected as a threat False negative = incorrectly rejected as a threat

Self contained breathing apparatus

The personal respiratory equipment used when extremely toxic chemicals are present, in an oxygen-deficient atmosphere, or when the contaminant or concentration is not known. The SCBA's are also typically used in emergency situations.

SCBA's consist of a bottle (tank or cylinder), carrying assembly, gauge, safety valve, and a full facepiece. The bottle is equipped with an alarm to warn the wearer when air in the tank is getting low (about 25% of the tank air remains). Some SCBA's operate in an open-circuit mode; that is, the exhaled air is vented to the atmosphere and not rebreathed. Other SCBA's operate in a closed-circuit mode where exhaled air is filtered before it is rebreathed.

Sensitivity of detection equipment

In the context of CBRNE, the term refers to the sensitivity of an instrument towards detecting a threat substance.

Sensitivity of explosives

Sensitivity of explosives classifies the ability of an explosive material (or energetic material) to be initiated upon receiving an external stimulus (e.g. impact, friction, flame, electric discharge) that can initiate an explosion.

Seveso Directives

In 1976, the Seveso accident prompted the adoption of legislation within the EU. The Seveso II Directive 2012/18/EU defines a number of requirements for operators of industrial sites using a certain amount of dangerous substances. First, the Directive aims to prevent major-accident hazards involving dangerous substances. The second goal is to limit the consequences of such accidents for mankind and for the environment.

Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances.

Shaped charge

An explosive charge shaped to enhance performance in some direction. Could be also combined with metal liner for further performance enhance.

Designed to produce a high velocity cutting or piercing jet, which is able to penetrate armour (military use) or cut surface (e.g. in demolition).

Shielding

This refers to external protection designed to reduce the intensity of ionising radiation. The shielding may be made of materials of different densities – in many cases; it is made of lead (Pb), tungsten (W) or depleted uranium (DU).

Shock tube

A shock tube (or nonel - brandname) is a non-electric initiation system. It is a thin resilient plastic tube coated internally with a thin layer of explosive. The shock tube is initiated using a shock tube initiator, which generates a shock wave. The shock wave passes through the tube and initiates the detonator in the opposite end of the tube.

Shock wave

Shock wave is an intense compression wave propagating in the material at supersonic speed in respect to the uncompressed material which it compresses, heats and plastically deforms. Shock waves can be generated by several mechanisms; one of them is by detonation of an explosive. This is called a detonation wave.

In physics, a shock wave (also spelled shockwave), or shock, is a type of propagating disturbance that moves faster than the local speed of sound in the medium. Like an ordinary wave, a shock wave carries energy and can propagate through a medium but is characterized by an abrupt, nearly discontinuous, change in pressure, temperature, and density of the medium.

Shrapnel

Shrapnel is pre-formed fragments from an explosive device.

Sievert

The sievert (Sv) is a unit for expressing equivalent and effective radiation doses.

See also: Gray.

Situational awareness

The state of individual and/or collective knowledge relating to past and current events, their implications and potential future developments.

Smallpox

Smallpox was a highly contagious infectious disease of humans induced by the human- specific poxvirus Variola virus. Transmission occurred through inhalation of airborne Variola virus, usually droplets expressed from the oral, nasal, or pharyngeal mucosa of an infected person. It was transmitted from one person to another primarily through prolonged face-to-face contact with an infected person, usually within a distance of 1.8 m (6 feet), but could also be spread through direct contact with infected bodily fluids or contaminated objects (fomites) such as bedding or clothing. Rarely, smallpox was spread by virus carried in the air in enclosed settings such as buildings, buses, and trains. All individuals infected with Variola virus developed the clinical picture of smallpox. In the course of the infection small blood vessels of the skin and in the mouth and throat were affected. In the skin it resulted in a characteristic maculopapular rash and, later, raised fluid- filled blisters.

The World Health Organization (WHO) certified the global eradication of the disease in 1980 (as no cases of naturally occurring smallpox have happened since 1977 thanks to the success of vaccination), and thus the vaccination was stopped. However, it is possible that variola virus (the virus that causes smallpox) could be used in a biological attack (an intentional release of viruses, bacteria, or other germs that can sicken or kill people, livestock, or crops), or according to some scientific literature hypothesis, such virus could also naturally emerge again during the epidemic outbreaks of a zoonotic orthopoxvirus infection in large and dense human populations.

Smokeless powder

A propellant used in small arms. Unlike black powder it does not produce much smoke on burning.

See also: Propellant.

Sodium chlorate

Chemical formula $NaClO_3$, CAS number 7775-09-9.

A white or colourless crystalline compound soluble in water. It is used as is an inorganic oxidizer and as a bleaching agent for paper and as an herbicide.

Sodium nitrate

Chemical formula $NaNO_3$, CAS number 7631-99-4.

Sodium nitrate is an inorganic substance. The white or colourless crystals are soluble in water. It is used as a fertilizer, oxidizer in pyrotechnic mixtures or as a food additive.

Sodium perchlorate

Chemical formula $NaClO_4$, CAS number 7601-89-0.

Sodium perchlorate is an inorganic oxidizer. The substance is a white or colourless crystalline compound soluble in water.

Solid

A solid is matter that has both a well-defined volume and a well-defined shape. It is defined as a material that has a melting point or an initial melting point above 20 °C at a pressure of 101.3 kPa (kilopascal).

Solubility

Solubility is the quantity of substance that will dissolve in a given amount of solvent to produce a saturated solution.

Soman

Abbreviation GD; An extremely toxic and corrosive neurotoxic organophosphorous agent, chemical warfare agent classified as a CWC Schedule 1 compound (see nerve agent for symptoms and treatment). In pure form, it is a colorless liquid with a faint odor like that of mothballs or rotten fruit but, more commonly, (and especially if synthetized by Non State actors), it would be impure and will have a yellow to brown color and has a strong odor described as similar to camphor. Soman is liquid under NTP (Normal Temperature and Pressure), but can evaporate easily and spread into the environment (bp around 198°C, but lower vapor pressure and volatility below than sarin). It is both more lethal and more persistent than sarin, but less so than cyclosarin.It is less volatile than Sarin but more toxic upon inhalation or skin contact.

LCt50: 35 mg.min/m3in humans; LD50 on skin: 0,71 mg/kg.

Sorting

See: Triage.

Source container, RN

This assembly of components is intended to guarantee the containment of a sealed source, where it is not an integral part of the source but is meant to shield the source during its transportation and handling.

Special arrangement

This covers provisions that have been approved by the competent authority and under which consignments which do not satisfy all the ADR requirements applicable to radioactive material may be transported.

Special fissonable material

A legal IAEA definition and means plutonium-239, uranium-233, uranium enriched in the isotopes 235 or 233 and any material containing one or more of the foregoing.

http://www.iaea.org/about/statute#a1-20

Special form

Special form is the term used for solid radioactive material which is not dispersible, or a sealed capsule containing radioactive material. The term is used in regulations on transportation of radioactive sources.

See: Type "A" package.

Special nuclear material

(SNM), Uranium enriched in the isotope Uranium-233 or Uranium-235 and Plutonium.

Special provision

A special provision is prepared for each particular dangerous goods application according to the respective transport regulations.

Specific activity

This refers to the activity of a radionuclide per unit mass of that nuclide normally expressed as Bq/g (Becquerels per gram). In the case of a material, the specific activity is the activity per unit mass or volume of that material in which the radionuclides are essentially uniformly distributed.

Specificity

The specificity of a detection instruments and methods reflects its ability to correctly identify substances, e.g. explosives.

The recommendation made by International union of Applied Chemistry(IUPAC) that specificity is the ultimate of selectivity.

The selectivity of an assay is a measure of the extent to which the method can determine a particular compound in the analysed matrices without interference from matrix components. A method that is perfectly selective for an analyte or group of analytes is said to be specific.

Specificity: The validation procedure should confirm the ability of the method to assess, unequivocally, the analyte in the presence of other components that may be expected to be present (e.g., impurities, degradation products and matrix components, etc).

See also: Selectivity of detection equipment.

Spectroscopy

Spectroscopy is a method based on the interaction between matter (i.e. that absorbs and emits light and other radiation) and Visible, IR, UV light, X-rays or gamma rays. It is mainly used to determine the chemical composition of a substance or its concentration.

Spore

Spores are dormant cells formed by certain organisms like bacteria or fungi to survive critical environmental conditions. Spores are surrounded by a thick multilayer cell wall and are highly resistant against extreme conditions of cold, heat and dryness. In comparison to the vegetative form of the agents, spores are also highly resistant against treatment with chemical and physical disinfectants. Therefore, special efforts have to be considered for an effective decontamination.

Spores of organisms like Bacillus anthracis could be suspected for usage as biological weapons.

Spot test

Spot tests use a combination of chemicals to identify a substance by its colour change when subjected to these chemicals. These small test kits are used for quick analysis of explosives in the field when time does not allow a more time consuming analysis or more advanced detection equipment is unavailable.

Staging area

See: Rendez-vous point.

Standard

A standard is a document, designed for common and repeated use, to be used as a rule, guideline or definition (i.e. a common and documented reference system intended to harmonize the activity of a sector). Standards can both be consensus-built and approved by a recognized body.

Standard operating procedure

(SOP) the established and documented procedure to be followed routinely for the performance of designated operations or in designated situations.

A standard operating procedure (SOP) is a set of step-by-step instructions compiled by an organization to help workers carry out complex routine operations. SOPs aim to achieve efficiency, quality output and uniformity of performance, while reducing miscommunication and failure to comply with industry regulations.

According to the International Council for Harmonisation (ICH), SOPs are defined as "detailed, written instructions to achieve uniformity of the performance of a specific function". SOPs usually get applied in pharmaceutical processing and for related clinical studies.

In CBRNE situations, e.g. a minimum detection standard or standards for PPE are suitable.

Standoff detection, explosives

Standoff detection is the ability to detect explosives or explosives contamination in/on a vehicle, package, person, or item from a distance large enough to place individuals and vital assets outside the explosion danger area or at least outside the zone of severe damage. This means that the distance required to qualify as standoff needs to be put in relation to the expected size of the explosive charge. Checking for a vehicle borne IED requires significantly larger distances than checking for a person borne IED considering the larger amounts that can be packed in the vehicle.

Staphylococcal enterotoxin B (SEB)

Toxin produced by the gram positive bacteria Staphylococcus aureus which cause gastrointestinal symptoms like diarrhea, vomiting, abdominal pain and cramping in humans, usually through consumption of contaminated food. Being quite stable, the toxin may remain active even after the contaminating bacteria are killed. It can withstand boiling at 100 °C for a few minutes. Inhalation of Staphylococcal enterotoxin B is linked to fever, headache and coughing. No known transmission between humans.

Stockholm Convention

The Stockholm Convention on Persistent Organic Pollutants is a global treaty to protect human health and the environment from chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissue of humans and wildlife, and have harmful impacts on human health or on the environment. The Convention was adopted in 2001 and entered into force in 2004; it requires its parties to take measures to eliminate or reduce the release of Persistent Organic Pollutants (POPs) into the environment and includes regulations about the production, use, import and export of POPs. National focal points must be appointed for information exchange.

Strain

A strain is a characterised genetic variant or subtype of a virus or bacterium or fungus.

Stress

State of cognitive, emotional and physical arousal caused by exposure to some actual or perceived demand or stimulus in the environment.

Subclinical infection

Following infection, no clinical signs are observed (nearly of completely asymptomatic); the infection can be detected by the production of antibodies against the agent.

Subsidiary risk

This is a risk in addition to the primary risk of dangerous goods.

Substance

A substance is matter which has a specific composition and specific properties.

Every pure element is a substance. Every pure compound is a substance.

Examples of substances: Iron is an element and hence is also a substance. Methane is a compound and hence is also a substance.

Examples of non-substances: Salt water is not a substance. It is a mixture of two substances - sodium chloride and water. Its composition and therefore its properties are not fixed. Gasoline is not a substance. It is a mixture of hydrocarbons and, depending on the composition of the gasoline mixture, gasoline's properties can vary.

Suicide bomber

See: IED, PBIED, VBIED.

Sulfur mustard

The sulfur mustards, also known as 'mustard gas' and sometimes only called 'mustard', are a group of related cytotoxic chemical warfare agents able to produce large blisters on exposed skin. Sulfur mustard is the main representative of blister agents (see also nitrogen mustard and lewisite), and belongs (with the other mustard agents to the Schedule 1 of the CWC).

Synonyms: H (impure sulfur mustard), HD (distilled sulfur mustard), S-Lost, Yperite. At room temperature, pure sulfur mustards are colourless or yellowish viscous liquids (with low volatility --e.g. bp: 217°C-and high persistency -- remains on the ground for days and weeks, and it continues to cause ill effects--). When used in impure form, such as warfare agents, they are usually yellow-brown and have an odor resembling mustard plants, garlic, or horseradish, hence the name.

The common name of "mustard gas" is considered inaccurate because the sulfur mustard is not actually vaporized, but dispersed as a fine mist of liquid droplets. Symptoms begin hours after exposure with severe pain at the exposed area. Exposure is frequently not immediately recognised by the affected person. The skin goes red and blisters and develops slow-healing chemical burns, within 24 hours of exposure to these mustard agents; the eyes become irritated and severe damage can lead to temporary functional blindness; and respiratory symptoms can range from irritation to lung oedema and airway damage. Severe illness and death will occur after high doses. In addition, sulfur mustard is strongly mutagenic and carcinogenic.

LCt50: 900 mg.min/m3; LD50 on skin: 100 mg/kg.

Sulfuric acid

Chemical formula H_2SO_4, CAS number 7664-93-9.

Sulfuric acid is a strong mineral acid. It is a colourless highly corrosive liquid, fully miscible in water. It is a key material for chemical industries.

Concentrated sulfuric acid has a concentration 98% sulfuric acid in water; battery acid used in car batteries has concentration 29-32%. Concentrated sulfuric acid could cause burning some organic substances.

See: HPVC.

Surface contaminated object

SCO, a solid object which is not in itself radioactive, biological or chemical, but which presents surface radioactive, biological or chemical contamination (i.e. radioactive, biological or chemical material is distributed on its surface).

Surface tension

This force causes the surface of a liquid to contract, reducing its surface area to a minimum – e.g. in zero gravity droplets of liquids create ideal spheres (a sphere has a minimal surface in relation to its volume).

Survivor

Any person, whether injured or not, who is not killed in an incident or emergency.

Suspect of infection

A suspected case of infection meets the clinical case definition. The signs and symptoms of a person are consistent or compatible with a particular disease. Laboratory confirmation or epidemiological link have to be performed.

See also: Person likely to be sick.

Suspicious transaction

Suspicious transactions are transactions that for example involve unusual amounts of the substance; the user does not know the normal use of the substance, the customer insists on paying cash, unusual concentrations or unusual combinations of substances, is unwilling to provide proof of identity or place of residence.

A suspicious transaction is any transaction concerning the substances listed in the Annexes to Regulation (EU) No 98/2013 on the marketing and use of explosives precursors. This includes transactions involving professional users, where there are reasonable grounds for suspecting that the substance or mixture is intended for the illicit manufacture of explosives.

The following substances are listed as precursors for which suspicious transactions shall be reported: Hexamethylenetetramine, Sulfuric acid, Acetone, Potassium nitrate, Sodium nitrate, Calcium nitrate, Calcium ammonium nitrate and Ammonium nitrate [in concentration of 16 % by weight of nitrogen in relation to ammonium nitrate or higher].

Swipe

A swipe (sometimes called swab) is a material used to collect a dangerous substance (e.g. explosive) from a surface and then used to transfer the collected explosives into a trace detector.

See: Detection, Trace detection, explosives.

Systemic infection

The infecting agent is widespread throughout the body, instead of being concentrated in one area.

TATP

Triacetone triperoxide, CAS number 17088-37-8.

TATP is a primary explosive that consists of snow-white crystals and is very sensitive to all normal stimuli such as impact, friction, static electricity, heat and flame. TATP is insoluble in water but soluble in most organic solvents. It is an homemade explosive.

TCDD

2,3,7,8-tetrachlorodibenzo-para-dioxin (TCDD) occurs in small quantities as an impurity during the synthesis of some chlorinated organic chemicals and incineration of certain chlorinated organic chemicals.

It is one of the most toxic chemicals: LD50 acute: approximately 2 µg/kg, and it is carcinogenic.

TEEL

A TEEL is a Temporary Emergency Exposure Limit similar to ERPGs, as defined by the US Department of Energy for use when ERPGs are not available. TEELs indicate the concentration levels to which nearly all individuals may be exposed for up to 1 hour:

- Without experiencing more than mild, transient adverse health effects or perceiving a clearly defined objectionable odour (TEEL-1);
- Without experiencing or developing irreversible or other serious health effects (TEEL-2); or
- Without experiencing or developing life-threatening health effects (TEEL-3).

TEEL-0 is a threshold concentration below which most people will experience no adverse health effects.

See also: Exposure limits for chemicals.

TIC

Toxic industrial chemicals (TICs) are used in industrial operations or research, which, if released, have adverse effects on human health or on the environment. Some TICs can be used as CWA, e.g. chlorine or phosgene. Any kind of TICs with an acute toxicity can be used as CWA as underlined by the CWC. According to the general purpose criterion of the CWC, a toxic or precursor chemical may be defined as a chemical weapon depending on its intended purpose. Put simply, a toxic or precursor chemical is defined as a chemical weapon unless it has been developed, produced, stockpiled or used for purposes not prohibited by the Convention. The definition thus includes any chemical intended for chemical weapons purposes, regardless of whether it is specifically listed in the Convention, its Annexes or the three schedules of chemicals.

NATO defines a TIC as a chemical that: (1) is more toxic than ammonia; and (2) is produced in quantities greater than 30 tons per year at any given production facility.

TIM

Toxic industrial material (TIM) is industry-associated material, in solid, liquid aerosolized, or gaseous form that may be used, or stored for use, for industrial, commercial, medical, military of domestic purposes, and that have the potential to cause harmful effects on humans. They can be subdivided into toxic industrial biologicals (TIBs), toxic industrial chemicals (TICs) and toxic industrial radiologicals (TIRs).

TLV

A Threshold Limit Value (TLV) is a chemical exposure limit for worker protection in occupational settings. TLV refers to airborne concentrations of substances and represents conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without any adverse effects.

See also: Exposure limits for chemicals.

TLV-C

A ThresholdLimit Value – Ceiling (TLV-C) is also a chemical exposure limit for worker protection in occupational settings. However, TLV-C refers to the concentration that should not be exceeded during any part of work exposure.

See also: Exposure limits for chemicals

TLV-STEL

A Threshold Limit Value Short-Term Exposure Limit (TLV-STEL) is a chemical exposure limit for worker protection in occupational settings. It refers to the concentration to which workers can be exposed for a short period of time without suffering from: irritation, chronic or irreversible tissue damage, or narcosis, to an extent that could precipitate industrial accidents, impair self-rescue, or reduce work efficiency. The daily TLV-TWA must not be exceeded.

STELs are only recommended for those substances for which there are evidence from human or animal studies that adverse health effects can be caused by high short-term exposure.

See also: Exposure limits for chemicals.

TLV-TWA

A Threshold Limit Value Time-Weighted Average (TLV-TWA) is a chemical exposure limit for worker protection in occupational settings. This refers to the time-weighted average concentration for a normal 8-hour working day and a 40-hour working week, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. The Permissible ExposureLimit (PEL) is given the same definition.

See also: Exposure limits for chemicals.

TWA

Time-Weighted Average.

See: TLV-TWA, Exposure limits for chemicals.

Tabun

Abbreviation GA, an extremely toxic and corrosive neurotoxic organophosphorous agent, chemical warfare agent classified as a CWC Schedule 1 compound (see nerve agent for symptoms and treatment). In pure form, it is a clear, colourless and tasteless liquid with a faint fruity odour, but less-pure tabun may be brown. Tabun is liquid under NTP (Normal Temperature and Pressure), bp around 240°C, and less volatile (lowest vapor pressure) than Sarin or Soman.

LCt50: 70 mg.min/m3; LD50 on skin: 21,42 mg/kg.

Technetium

Technetium (Tc) is a radioactive metal. The isotope Technetium 99m has a short half-life of 6 hours. It is the most prevalent diagnostic agent in nuclear medicine.

Technology Readiness level

Technology readiness levels (TRLs) are a method for estimating the maturity of technologies during the acquisition phase of a program. The use of TRLs enables consistent, uniform discussions of technical maturity across different types of technology. A technology's TRL is determined during a Technology Readiness Assessment (TRA) that examines program concepts, technology requirements, and demonstrated technology capabilities. TRLs are based on a scale from 1 to 9 with 9 being the most mature technology.

Telemetry

Use of telecommunications to transmit and read data from remote measurement instruments.

Thiodiglycol

Synonyms: bis(2-hydroxyethyl) sulphide, 2,2'-thiodiethanol, 2,2'-thio- bis-ethanol, Formula: $C_4H_{10}O_2S$,. CAS No 111-48-8.

Thiodiglycol is a pale yellow, oily liquid, which is soluble in water, ethanol, acetone and chloroform. The substance is used in the production of coatings, dyestuffs, and rubber chemicals and in the textile industry. It is listed in Schedule 2B13 of the Chemicals Weapon Convention.

Threat

Potential cause of an unwanted incident, which may result in harm to individuals, assets, a system or organization, the environment or the community.

[SOURCE: ISO 22300: 2018 'Security and resilience — Vocabulary']

See also: Hazard.

Threat assessment

A component of the civil protection risk assessment process in which identified threats are assessed for risk treatment.

Toxic

Poisonous; able to be harmful or deadly to any form of living organisms as a result of physicochemical, poisonous interaction of the substance with cellular components.

Toxic chemical

The Chemical Weapons Convention defines a toxic chemical as any chemical that can be used directly as a weapon agent.

According to Article 2 of the CWC, "Toxic chemical" means any chemical that through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals.

Toxicant

A toxicant (in the broadest meaning) is any toxic, poisonous substance. In a narrow sense, a toxicant is a poisonous substance not derived from the metabolism of an organism. By using this definition, poisonous chemicals can be differentiated from toxins, which are poisonous organic substances produced by living cells (bacteria or fungi, etc.) or organisms (like spiders, snakes and scorpions, etc.).

Toxicity

The term toxicity describes the degree to which a substance like a toxin has an effect on a living organism (human, animal, plant, bacterium etc.). Toxicity is generally expressed as a dose–response relationship, involving the quantity of substance to which the organism is exposed and the route of exposure.

Toxicity can refer to the effect on a substructure of the organism, such as a cell (cytotoxicity) or an organ such as the liver (hepatotoxicity).

See also: Lethal dose.

Toxicodynamics

The study of the cellular and molecular action mechanisms of a poison. Put simply, toxicodynamics is what a poison does to the body. The defining factors for any toxic effect are the toxicity, latency and persistency of the toxic substance (sometimes transmissibility is added).

See also: Toxicology

Toxicokinetics

The study of the absorption, distribution, metabolism and elimination of a poison. Put simply, toxicokinetics explains what the body does to the poison.

See also: Toxicology

Toxicology

This is the science or study of poisons or – to be more precise – the study of the nature and effects of poisons, their detection and the treatment of poisoning. Since clinical toxicology concerns the study of poisons with regard to their effect on humans, it is therefore considered to be a branch of medicine.

Other sub-specialisations are: experimental toxicology (testing new drugs in pharmacology), environmental toxicology (study of environmental pollution), developmental toxicology (study of the effects of toxins on the development of embryos; in embryology), etc.

Toxidrome

A toxidrome (a combination of 'toxic' and 'syndrome') is a syndrome – a collection of signs and symptoms that is characteristic of a single condition – caused by a specific level of toxins in the body. As such, it is a recognisable and typical constellation of symptoms and signs characterising exposure to a specific toxic substance (or kind of substance).

Toxin

A poisonous substance produced by living cells or organisms with the ability to cause a disease by contact with or uptake by the body and interaction with cellular proteins (enzymes or cellular receptors). Severity of symptoms can vary. Toxins can be small molecules, peptides or proteins.

According to OPCW, toxins are toxic chemicals produced by living organisms. These are considered as both chemical and biological weapons when used in violation of the Convention.

The development, production and stockpiling of toxins for purposes of warfare are prohibited under both the CWC and Biological Weapons Convention (BWC). Like the CWC, the BWC also requires States parties that possess toxin weapons to destroy them.

Toxins are covered by the CWC because they are chemicals that can have chemical weapons applications, and fall under the definitions listed above for chemical weapons and toxic chemicals.

Synthetic Toxins: it is possible to synthesis many types of toxins in laboratories without harvesting the organisms that produce them in nature. Moreover, a number of toxins are also synthetic dual-use chemicals, meaning that under the CWC they can be produced in the quantities required for legitimate activities.

There are two toxins explicitly listed in Schedule 1, these are ricin (produced in nature in the seeds of the castor bean plant) and saxitoxin (produced in nature by cyanobacteria).

Toxinology

An interdisciplinary scientific branch of toxicology. Toxinology focuses exclusively on toxins from plants, animals, fungi and microorganisms like moulds or bacteria and their effects. Synthetically derived toxins are excluded from the field of toxinology.

Trace detection, particle detection

Trace detection is the act of finding small quantities of chemicals, biological and explosives.

Traces can be available for detection in the form of very small particle traces left after handling and packaging the explosive or in the form of vapour traces emanating from the bulk substance.

See: Explosive trace detector.

Tra**ining certificates for drivers**

Commonly known as an 'ADR licence', a training certificate is issued to drivers by the competent authority of each country and is valid for five years.

Transmissibility

Transmissibility is the quality of a disease or trait being able to be passed on from one person or organism to another.

See also: Toxicology, Toxicodynamics.

Transmissible infection

An infection capable of being transmitted from one host to another host (could be animal to another, from human to human, from animal to human (zoonosis) or from human to animal). In addition, usually the route of infection is described: sexually transmissible infection, transfusion-transmissible infection, transmission by a vector (vector-borne infection), air droplet, faecal-oral, unclean wound, mother to child.

See also: Contagious disease.

Transport index

The Transport index (TI) is a number, which is assigned to a package, overpack or container, or to unpackaged LSA-I or SCO-I, for the carriage of radioactive material. The number is used to control radiation exposure. With the exception of consignments under exclusive use, the transport index for any package or overpack cannot exceed 10. The TI corresponds to the maximum dose rate, expressed in mrem/h (millirem/hour), measured at 1 metre.

To obtain the maximum dose rate in mSv/h, which is to be expected in 1 mdistance from the surface, the TI must be divided through 100.

Transport legislation

See: ADR, ADR labels, Classes of dangerous goods, Convention on the Physical Protection of Nuclear Material, Dangerous goods core legislation, Excepted fissile, Industrial package, N.O.S., Package RN, Packing group, Special arrangement, Transport index, Tremcards, Tunnel restriction code, Type "A" package, Type "B" package, Type "C" package.

Transportation of dangerous goods

This concerns the transfer of dangerous goods, including the stops required by the conditions of carriage and other dangerous goods vehicles, tanks and containers, according to the traffic situation before, during and after the transfer. Shipping also includes the temporary storage of dangerous goods for the purposes of changing the mode or means of transport (trans- shipment).

Tremcards

Safety instructions are arranged in a preset pattern on a transport emergency card and delivered by the employer to the carrier in a language understood by the driver. Tremcards carry instructions and information to which the driver can refer in case of an accident involving dangerous goods.

Triage

Assessment of casualties and allocation of priorities by the medical services at the scene or a receiving hospital. Also called: Sorting.

Trialling

A process where in same or very similar scenarios performance of multiple new solutions (prototypes/demonstrators) based on different technologies from different solution providers is considered. The aim of trialling should be to identify promising solutions and technologies and help bring them to the market.

Trialling is a scenario-based performance testing of equipment with the intent to assess the performance in that particular scenario in a way that can be compared with other detection equipment.

See: COM(2007) 651 final.

Trinitrotoluene

Trinitrotulene also known as TNT is an explosive material that can very quickly change from a solid into hot expanding gases. High exposures may cause weakness, anemia, headaches, liver, or central nervous system damage. TNT is a possible human carcinogen.

See: TNT.

Tularemia

Infectious disease caused by the bacterium *Francisella tularensis*.

Tunnel restriction code

This alphabetical code (A to E) is assigned to a road tunnel based on the characteristics of the gallery and the risk assessment, taking into account the availability and convenience of routes and alternative modes of transport and traffic management.

Type 'A' packages

<radiological> radionuclides transport package classification and labelling system for transport radionuclides for medical purposes and for some nuclear fuel cycle materials.

Note: The basic packages are required to maintain their integrity during normal transport conditions. Since it is assumed that this type of package could be damaged in a severe accident and that part of the contents may be released, the amount of specific radionuclide activity they can contain is limited by International Atomic Energy Agency (IAEA) regulations.

T**ype 'B' packages**

<radiological> radionuclides transport package classification and labelling system for transport of highly radioactive material, e.g. unencapsulated radioisotopes for medical and research uses, or spent nuclear fuel.

Note 1: The packaging container is designed and constructed to contain specific radionuclides whose levels of radioactivity are greater than A1 or A2 values.

Note 2: The outermost layer of a Type B(U) and Type B(M) package must be fire- and water-resistant.

Note 3:This outer container will be plainly marked by embossing, stamping or other means with the trefoil symbol, as shown in the figure below.

Type 'C' packages

<radiological> radionuclides transport package classification and labelling system for transport of fissile material by air (e.g. plutonium).

Note 1: The packaging container is designed and constructed to contain specific radionuclides whose levels of radioactivity are greater than A1 or A2 values.

Note 2: The outermost layer of a Type C package is fire- and water-resistant.

Note 3: This outer container shall be plainly marked by embossing, stamping or other means with the trefoil symbol.

Note 4: Requirements for Type A, Type B and Type C packages and packages for fissile materials are given in the ADR, 6.4.7 to 6.4.11.

UN number, chemical

A four-digit number for the labelling of hazardous substances in international transport. Most hazardous substances possess a unique UN number (e.g. UN1017: chlorine).

Note 1: The complete list of UN numbers can be found in the ADR/RID Regulation. Some UN numbers denote groups of substances (e.g. UN1993: Flammable liquid n.o.s. – where n.o.s. means "not otherwise specified").

Note 2: The UN number is to be found:

- on tank vehicles as the lower number on the numbered orange plate (without the letters "UN");
- on packages (with the letters "UN"); and
- in transportation documents.

Reference: http://www.unece.org/fileadmin/DAM/trans/danger/publi/unrec/rev17/English/05ERev17_index.pdf

UN number, nuclear

This is a four-digit identification number given to the subjects and objects defined in the UN Model Regulations.

Reference for all UN Definitions as listed below:

http://www-pub.iaea.org/MTCD/publications/PDF/Pub1614_web.pdf

UN 2908

RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - EMPTY PACKAGING.

UN 2909

RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM.

UN 2910

RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL.

UN 2911

RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - INSTRUMENTS or ARTICLES.

UN 2912

RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non-fissile or fissile-excepted.

UN 2913

RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), non-fissile or fissile-excepted.

UN 2915

RADIOACTIVE MATERIAL, TYPE A PACKAGE, non-special form, non-fissile or fissile-excepted.

UN 2916

RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, non-fissile or fissile- excepted.

UN 2917

RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, non-fissile or fissile- excepted.

UN 2919

RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, non-fissile or fissile-excepted.

UN 2977

RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE.

UN 2978

RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, non-fissile or fissile excepted.

UN 3321

RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), non-fissile or fissile-excepted.

UN 3322

RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III), non-fissile or fissile-excepted.

UN 3323

RADIOACTIVE MATERIAL, TYPE C PACKAGE, non-fissile or fissile-excepted.

UN 3324

RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), FISSILE.

UN 3325

RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY, (LSA-III), FISSILE.

UN 3326

RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), FISSILE.

UN 3327

RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE, non-special form.

UN 3328

RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE.

UN 3329

RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE.

UN 3330

RADIOACTIVE MATERIAL, TYPE C PACKAGE, FISSILE.

UN 3331

RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE.

UN 3332

RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, non-fissile or fissile-excepted.

UN 3333

RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE.

USARCBRN

See Urban Search and Rescue in CBRN conditions module.

Unilateral approval

This concerns approval of a package design which is only required from the competent authority in the design's country of origin.

Unirradiated thorium

The name given to the naturally occurring, mildly radioactive metal, thorium (Th) that contains no more than 10exp-7 gram of uranium-233 per gram of thorium-232. Uranium-233 is produced by the neutron irradiation of thorium-232.

Uranium

The chemical element uranium (U) is a very dense, heavy and silvery-white metal found naturally as ore in deposits. It is composed of three major isotopes: uranium-238 (more than 99 %), uranium-235 (0.72 %), and uranium-234 (0.005 %). Exposure to uranium can result in both chemical and radiological toxic effects. Chemically, it is very toxic after ingestion or inhalation, the main target organ being the kidney. It is used to fuel nuclear reactors, often after the per cent composition of uranium-235 has been increased to form enriched uranium (typically 3-5 % enrichment) or to produce nuclear weapons (90 % or more enrichment).

See: Depleted uranium, uranium 234, uranium 235, uranium 238.

ium 234

Naturally occurring uranium contains 0.005 % of uranium-234 (234U). It is produced in the decay chain of uranium-238, and has a half-life of 246 000 years.

Uranium 235

Naturally occurring uranium contains 0.72 % of uranium-235 (235U), which is the fissile isotope of uranium. It has a half-life of 703.8 million years.

Uranium 238

Naturally occurring uranium contains 99.284 % of uranium-238 (238U) isotope, which is fissionable but non-fissile.

Urban Search and Rescue in CBRN conditions module

The Urban Search and Rescue in CBRN conditions module (USARCBRN) is a certified module and part of the European Civil Protection capabilities. The modules are temporarily self-sufficient and are able to sustain a search and rescue operation in a contaminated environment as well as to decontaminate staff, victims and equipment afterwards.

Reference: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1422439505236&uri=CELEX:32014D0762

VRI

See : International vehicle registration.

VX

VX is the most well known of the V-series of nerve agents (see for symptoms and treatment).

An extremely toxic and corrosive neurotoxic organophosphorous agent, chemical warfare agent classified as a CWC Schedule 1(A.03) compound (see nerve agent for symptoms and treatment). In pure form, it is a colorless liquid, but usually a pale yellow liquid. VX is liquid under NTP (Normal Temperature and Pressure), is highly involatile and thus, under normal circumstances, there is rarely a risk of breathing in vapour, and route of exposure is invariably skin contact.

See also: chemical warfare agent, organophosphorous compounds.

VX has a high viscosity and low volatility, which makes it particularly dangerous as it has a high persistence in the environment. It is odourless and tasteless and can be dispersed as a liquid, both pure or in mixed with a polymer in the form of a thickened agent or as an aerosol.

Lack of significant vapour hinders detection.

LCt_{50}: 15 mg.min/m3 in humans; LD50 on skin: 0,071 mg/kg.

Vaccination

Administration of vaccines in order to yield immunity against a causative biological agent and protection from subsequent disease (active immunisation).

Vaccine

A biological preparation that induces or improves protective active acquired immunity against a particular infection or disease.

Live vaccines contain agents, which are able to replicate in the vaccinated human or animal and typically contain an agent related to the disease- causing microorganism, which is an avirulent or attenuated strain of the agent.

Inactivated or dead vaccines contain the killed organism, parts of it or of biological toxins. Inactivated vaccines are administered as suspension, using adjuvants for immune stimulation.

DNA vaccines code for the relevant antigens, which induce protection.

Vapour detection

See: Trace detection.

Vapour pressure

The vapour pressure (or tension of saturated vapours) is the pressure exerted by a vapour when a state of equilibrium exists between the vapour and its liquid (or solid) state. It is the pressure in a closed space above a substance when no other gas is present. A substance with a high vapour pressure at normal temperatures is often referred to as volatile.

Variola virus

Variola virus is the cause of smallpox. The virus is grouped to the Orthopoxviruses (OPV) within the family of Poxviridae. OPVs cannot be morphologically distinguished and are genetically closely related to each other. Therefore specific diagnostic tools were developed to differentiate infections with OPV like monkeypox or cowpox virus.

Vector, biological

Infectious agents can be transmitted by living and dead vectors. Furthermore vectors can act mechanically or biologically. Mechanical transmission can occur by picking up an infectious agent (from clothes or surfaces) and by transmitting it to a susceptible host by direct contact with the contaminated material. Often biological vectors replicate the infectious agents in their bodies and transmit the agent to the host in an active manner. Of special interest are arthropod vectors (e.g. mosquitos, ticks etc.) that can take up the infectious agent generally by biting and replicate the pathogen (viruses [i.e. arboviruses], bacteria [plague] or parasites [malaria]) without signs of an infection. Transmission of the agent from the vector to the (uninfected) host occurs by biting, in general during a blood meal.

Vehicles, biological

Infectious agents can be transmitted by organisms (vectors) or by inanimate objects (Vehicles or fomites --clothes, bedding, utensils, furniture--). This includes contact materials such as door-handles and money, but also other materials such as dust and water.

Vehicle Borne Improvised Explosive Device

A Vehicle Borne Improvised Explosive Device (VBIED) is an improvised explosive device carried by a vehicle with the intention of attacking people or property by detonating the device while in the vehicle.

See also: PBIED.

Verification confirmation, through the provision of objective evidence, that specified requirements have been fulfilled.

[SOURCE: ISO 9000:2015, 3.8.12, modified]

Vesicants

See: Blister agent.

Victims

Any person, whether injured or not, who is affected psychologically or physically by an incident or emergency.

Viral encephalitis

Encephalitis refers to an acute, usually diffuse, inflammation of the brain, there are several causes but the most common is viral infection. Encephalitis often causes fever, headache, and clouding of consciousness together with seizures and focal neurology in some cases (problems with senses or movement). And rarely can be life-threatening.

Viral hemorrhagic fever

See: Hemorrhagic fever virus.

Virus

Agent containing a sole type of nucleic acid (i.e. DNA or RNA), capable of reproducing by replication, starting from their own genetic material, and only in a host cell. Spreading diseases by moving from host to host.

Viruses can infect all types of life forms, from animals and plants to microorganisms, including bacteria and archaea.

Volatility

Volatility (or maximum concentration in a closed space) is the tendency of a solid or liquid substance to pass into the vapour state at a given temperature. The volatility depends on vapour pressure and varies according to the temperature.

Vulnerability

Susceptibility of individuals or community, services or infrastructure to damage or harm arising from an hazard.

WHO

WHO (World Health Organisation) is an agency of the United Nations (UN), based in Geneva (Switzerland). Within the UN, it is the directing and coordinating authority for health. Its main duties and responsibilities

include the leadership on global health matters and global public health promotion. In 2007, WHO started to implement the International Health Regulations.

Warm zone

The area uncontaminated by the initial release of a substance, which becomes contaminated by the movement of people or vehicles. This is an area next to the Hot Zone that is considered safe for workers to enter with appropriate personal protective equipment. This includes areas used for decontamination activities.

See also: Hot zone, Cold zone, Decontamination

Warning plate (ADR)

See: Orange Plate.

Waste

This refers to substances, solutions, mixtures or items that cannot be used as such but which are transported for reprocessing, disposed of in a landfill, or disposed of by incineration or by another method.

Water-borne infection

The route of exposure to the infecting agent is by water.

See also: Vehicles, biological.

Weapons of Mass destruction

The 2004 UN Security Council Resolution 1540 implicitly defines weapons of mass destruction (WMD) as nuclear, chemical and biological weapons, including their means of delivery (missiles, rockets and other unmanned systems). The Resolution states that UN member states must impede non-state actors in the development, acquisition, manufacture, possession, transport, transfer, or use of such WMD.

The EU Strategy against the Proliferation of Weapons of Mass Destruction sets out the objective to prevent, deter, halt and, where possible, eliminate the proliferation of WMD, but does not provide a definition.

Wet decontamination

The application of water (or other liquids) to decontaminate people, property or infrastructures.

See also: Dry decontamination, Mass decontamination.

Wettability

The property (ability) of a solid surface to reduce the surface tension of a liquid in contact with it so that it spreads over the surface and wets it.

X-**ray fluorescence**

X-ray fluorescence (XRF) is an analytical method that uses characteristic X-rays (fluorescent X-rays) generated when X-rays irradiate a substance. This technique is used in both hand-held (field) and laboratory instruments. It provides one of the simplest, most accurate and economical analytical methods for determining the chemical composition of many types of materials.

X-ray machine

This device is able to produce ionising radiation (X-rays), usually by the acceleration of charged particles. These X-rays pass through the human body and an image is formed from the 'shadow' created by the body as it is positioned between the X-ray machine (source of the X-ray beam) and the X-ray detector.

X-rays

or Roentgen rays, refer to ionising or high-energy electromagnetic radiation, which has much shorter wavelengths than those of visible light. X-rays can be produced in parcels of energy called photons. X-rays are emitted from the electron shells outside the nucleus of an atom or by the breaking or deceleration of an electron when deflected by an atomic nucleus.

Yellow fever virus

See: Yellow fever.

Yellow fewer

Yellow fever (YF) is induced by the yellow fever virus (YFV). YFV (also grouped to the arboviruses) belongs to the Flaviviridae genus flavivirus, is found in tropical and subtropical areas in South America and Africa and is transmitted to humans by the bite of an infected mosquito (Aedes aegypti). YF can have a mild course with fever, headache and jaundice, but severe cases with liver and renal failure and bleeding are also observed. The case-fatality rate in unvaccinated patients can reach 50%. An effective live vaccine is available. A safe and effective vaccine against yellow fever exists, and some countries require vaccinations for travelers. YFV has been researched by several countries as a potential biological weapon.

Yellowcake

Coarse powder which is insoluble in water, containing 80% uranium oxide (U_3O_8 mainly) obtained from milling and chemical processing of uranium ore. It is used for the production of reactor nuclear fuel such as uranium oxide (without enrichment) or uranium fluoride (for enrichment).

Yersinia pestis

A non-motile, Gram-negative rod-shaped bacterium belonging to the family of Enterobacteriaceae. It is a facultative anaerobe and can infect humans and animals. Several species of rodents serve as the main reservoir for Y. pestis in the environment. The transmission of Yersinia pestis by fleas (Xenopsylla cheopis; the rat flea) within susceptible animal populations and to humans is well characterised. Infection of fleas occurs during feeding on an infected animal, groin and neck region.

See also: Plague.

Yperite

See : Sulfur mustard, vesicants.

Zoonosis

See: Zoonotic disease.

Zoonotic disease

A disease that affects both humans and animals (more specifically, a disease that normally exists in animals but that can infect humans). It is estimated that around 60% of human pathogens are also pathogenic for other animals.

Annexes

Annex 1. List of International Agreements and Conventions applicable to CBRN sector

- Biological and Toxin Weapons Convention (BTWC)
- Chicago Convention
- Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on mutual assistance and cooperation between customs administrations
- Convention on Nuclear SafetyIAEA
- Convention on the Physical Protection of Nuclear Material
- Convention on the Transboundary Effects of Industrial Accidents (UNECE) 1991
- Chemical Weapons Convention (CWC)
- Dangerous goods core legislation
- Multilateral export control regimes
- International chemical safety cards
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Special arrangement
- UN Number (chemical)
- UN Number (nuclear)
- Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (i.e. 2005 Protocol to the SUA Convention)
- Convention for the suppression of unlawful acts against the safety of civil aviation (with Final Act of the Interna tional Conference on Air Law held under the auspices of the International Civil Aviation Organization at Montreal in September 1971)
- Concluded at Montreal on 23 September 1971
- European agreement concerning the international transport of Dangerous Goods by Road (ADR)

Annex 2. European Legislation on CBRNE topics

Council Decision 87/600/Euratom

Council Decision 87/600/Euratom– For early exchange of information in case of a radiological emergency. The Commission acts as a hub among National Authorities. The State where the emergency happened must provide information.

Reference: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31987D0600:EN:HTML

Council Directive 2003/122/Euratom

Council Directive 2003/122/EURATOM on the control of high-activity sealed radioactive sources and orphan sources. The Directive regulates marking and traceability of high activity sources, recovering of orphan sources. An international cooperation and information exchange system is scheduled, National competent Authorities are designated.

Reference: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32003L0122

Council Directive 2006/117/Euratom

Council Directive 2006/117/EURATOM. Supervision and control of intra and extra Community shipments of radioactive waste and spent fuel, for disposal or reprocessing. Countries have to appoint surveillance authorities.

Reference: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:337:0021:0032:EN:PDF

Council Directive 2008/114/EC

Council Directive 2008/114/EC on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection.

See: Critical infrastructure

Reference: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0114&from=EN

Council Directive 2009/71/Euratom

Council Directive 2009/71/Euratom – establishing a Community framework for the nuclear safety of nuclear installations – It covers all civil nuclear facilities other than those with nuclear reactors. States must establish a national legislative, regulatory and organisational framework for nuclear safety, national regulatory authorities. The licence holders have to conduct periodical self-assessments.

Reference: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:172:0018:0022:EN:PDF

Council Directive 2013/59/Euratom

lays down the basic safety standards for protection against the dangers arising from exposure to ionising radiation.

http://eur-lex.europa.eu/legal-content/FR/TXT/PDF/

Council Directive 93/15/EEC

Council Directive 93/15/EEC on the harmonization of the provisions relating to the placing on the market and supervision of explosives for civil use. This Directive shall not apply to explosives and ammunition intended for use by the armed forces or the police. It also does not apply to pyrotechnical articles.

Reference: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31993L0015&from=EN

Council Directive 96/82/EC

See: Seveso Directives.

Council Regulation (EC) No 428/2009

Council Regulation (EC) No 428/2009 (2017 consolidated version) sets up a Community regime for export, transfer, transit and brokering of dual-use items, which are listed in Annex I and Annex IV of the Regulation. It lays down a secure regime for exchanging sensitive information between the competent authorities of the Member States.

Regulation (EC) No 428/2009 (governs the EU's export control regime, which includes:

- common export control rules, including a common set of assessment criteria and common types of authorisations (individual, global and general authorisations)
- a common EU list of dual-use items
- a 'catch-all clause' for non-listed items which could be used e.g. in connection with a WMD programme
- controls on brokering dual-use items and their transit through the EU
- specific control measures to be introduced by exporters, such as record-keeping and registers
- provisions setting up a network of competent authorities supporting the exchange of information and the consistent implementation and enforcement of controls throughout the EU

In certain cases, EU countries may put extra controls on non-listed dual-use items because of public security or human rights considerations.

In specific cases, additional EU restrictive measures may apply to dual-use exports.

Reference: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:134:0001:0269:en:PDF

Council Regulation (Euratom) No 1493/93

Council Regulation (EURATOM) No. 1493/93. Shipments of sealed sources, radioactive waste are regulated by a system of prior declaration and confirmation by competent Authorities of each state. Includes a post shipment information procedure.

Reference: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:31993R1493

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